DOCUMENT RESUME

ED 246 744 HE 017 375

TITLE	Institutional Research and Planning in the Next Decade. Proceedings from the Annual Conference of the North East Association for Institutional Research (10th, Hershey, Pennsylvania, October 16-18, 1983). Tenth Anniversary Issue.
INSTITUTION	North East Association for Institutional Research.
PUB DATE	Oct 83
NOTE	314p.; Some pages will have marginal reproducibility.
AVAILABLE FROM	North East Association for Institutional Research, Mercy College, 555 Broadway, Dobbs Ferry, NY 10522 ($10.00).
PUB TYPE	Collected Works - Conference Proceedings (021) -- Viewpoints (120) -- Speeches/Conference Papers (150)
EDRS PRICE	MF01/PC13 Plus Postage.
DESCRIPTORS	*Academic Persistence; College Administration; College Bound Students; *College Planning; *Computer Oriented Programs; Decision Making; Educational Finance; Higher Education; *Institutional Research; *Marketing; *Outcomes of Education

ABSTRACT

Proceedings of the 1983 conference of the North East Association for Institutional Research are presented. The contribution of institutional research to university decision making and the topics of student outcomes assessment, retention/attrition studies, marketing/market research, departmental studies, computer and technological applications, and financial concerns are addressed in 27 papers. Papers and titles include the following: "The Role of Research in Marketing" (Susan Juba, G. Jeremiah Ryan); "Predicting the Likelihood of Matriculation for College Applicants" (Ronald F. Perry, David L. Rumpf); "A Comprehensive Approach to Outcomes Studies" (Bayard O. Baylis); "The Second Time Around: A Study of Recipients of Second Baccalaureates" (Diane Lampe, Marilynn Draxl, Edward Roke); "College Student Retention: Measurement of the Relative Importance of Causal Factors" (Norman D. Aitken); "The Effects of Information Processing on Information Usage" (Jane Grosset); "The Impact of Leadership on the Planning Process" (Janyce J. Napora); "Cost-Benefit Analysis For Academic Departments Using a Microcomputer" (S. Marie Genevieve Love, Colleen M. Fennell); "The Impact of Market Forces on Institutional Decision Making in a Time of Turbulence for Higher Education" (Donald G. Hester). (SW)

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10th Anniversary Issue

INSTITUTIONAL RESEARCH AND PLANNING IN THE NEXT DECADE

Proceedings from the 10th Annual Conference

North
East
Association for
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October 16 - 18, 1983

Hershey, Pennsylvania

INSTITUTIONAL RESEARCH AND PLANNING IN THE NEXT DECADE

Proceedings from the 10th Annual Conference

North
East
Association for
Institutional
Research

October 16 - 18, 1983
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FOREWORD

The Tenth Annual Conference of the North East Association for Institutional Research was held on October 16-18, 1983 at the Hershey Lodge in Hershey, Pennsylvania. The Conference, which had the theme "Institutional Research and Planning in the Next Decade: Choice and Change," attracted 176 participants.

As in the previous conferences there were a variety of topics and presentation formats. Many of the papers are included in the Proceedings, although not all of them were submitted for publication. Among the highlights of the conference were the Keynote Address by Ted Hollander and the luncheon remarks by Bob Grose. Dr. Hollander shared his insights about the importance of the next year or two for reestablishing a high priority for higher education in the Northeast, while Bob recounted the origins of NEAIR.

Perhaps the biggest departure from past conferences was the use of micro-computers and computer terminals. The workshops on computer graphics and statistical techniques and the informal micro-computer session were particularly well received by the participants.

It was my pleasure to serve as the Program Chairman for the Conference. Special appreciation is due to Marilynn Draxl, the Local Arrangements Chair, whose work before and during the Conference contributed to its success. Thanks are also due to all the presenters, panelists, and others that contributed to the success of the Conference.

The final form of the Proceedings is the result of the efforts by Marjorie Raab, the Publications Chair, and her associates Kathleen Kopf, Pauline Lichtenstein, Andrew Lolli, and Carol Wurster.

Paul Wing, NEAIR President

THE NEAIR LOGO

The NEAIR logo was designed by Sharon Heyenck, M.S. in Communication Design, Rochester Institute of Technology. Since 1980, it has represented the Association as a professional organization with members actively engaged in an information network. The arrows symbolize the sharing and exchange of ideas among members and others outside the Association. The north east quadrant of the design is highlighted to emphasize the regional orientation. The organized structure of the design symbolizes the disciplined approach to problem-solving which is the contribution made to higher education through the field of Institutional Research.

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1981	Planning for Quality	ED122-103
1982	Doing Institutional Research: A Focus on Professional Development	ED233-665

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Marketing/Market Research

DEVELOPING AN INQUIRY TRACKING SYSTEM FOR MARKETING PURPOSES

Gretchen Boris, Assistant Director Insitutional Research
Community College of Philadelphia

INTRODUCTION

With increasing competition among schools for students, marketing has become a greater concern for all colleges. Because of the previous lack of the need for marketing activities, many administrators have little or no experience in this area. Often marketing activities are haphazard affairs conducted by any department which has an interest in increasing the school's, or their, enrollments. This was primarily the case at the Community College of Philadelphia (CCP), therefore a system was developed to try and keep track of marketing efforts at the school.

The major marketing responsibilities lie in two departments at CCP: admissions and public relations. The admissions office is in charge of such activities as high school recruiting, college fairs, and direct mail activities. This office also operates an information booth on campus. The public relations office, in coordination with admissions, has charge of all advertising, printing of brochures and so forth. This office also operates the college telephone information center. Individual departments such as the academic divisions sometimes do recruiting or mailings of their own in conjunction with admissions and public relations.

In the broadest terms, there is the general population to whom CCP directs its marketing and recruiting efforts, generating inquiries into the college that are derived from a number of sources. Of these inquiries, a certain number apply for admission, and of that number some enroll at the college.

The inquiry tracking system was designed to monitor this chain of events for both recruiting students and measuring effectiveness of different marketing strategies.

In the simplest statement of its concept, the inquiry tracking system records the inquiries into the school by source of inquiry, notes which of the inquiries apply for admission and which of the applicants enroll. Review of the sources then determines which are the most effective in enrolling new students.

The inquiry tracking system used at CCP has undergone a few alterations because of problems. This paper will present the original version, the problems encountered, and the revised version in as clear a form as possible.

THE INQUIRY SYSTEM

Steps in the Inquiry Process

People who are interested in the college do one (or more) of many things to obtain information about the college:

- call CCP's telephone information number, advertised on the radio and in some print ads;
- actually come to the campus, either the admissions office or the information desk;
- mail in coupons or business reply cards that are parts of distributive ad campaigns, such as brochures handed out at college fairs, direct mail campaigns and so forth.

All of these above inquiry sources try to elicit most of the same basic information from the people inquiring:

- name, address, and telephone number;
- social security number;
- information requested by the inquiry;
- year and term of interest;
- program of interest.

The college uses all of these inquiries as input into an inquiry tape computer file, adding the following information to each record:

- an alpha-numeric key generated by the computer program;

- the date the inquiry was received by the school;
- a code for the source of the inquiry.

The inquiry system tape has a record for every inquiry received by the college with all of the above information on it, plus space to add more information as the system progresses. This tape file then serves as the data base for future inquiry and marketing activities, such as generating labels for mailing the requested information and so forth.

The file is updated on a weekly basis, matching inquiry records to the admissions file and the registration file to determine how many of the inquiries had either applied or enrolled at the college. People found to have applied or enrolled are taken off the active inquiry file and put on a history file with codes indicating their status.

During the updating process, telephone lists are also generated so that the school can follow-up on prospective students who had inquired, but not yet applied or enrolled. Three weeks are allowed between the time the information is sent to the inquiry and the time the inquiry is placed on a telephone list.

After telephone calls are made, all who said they were no longer interested or asked to be removed from the system are put on the history file. All other inquiries remain on the active file until they apply or enroll or until after the start of the term and year they had expressed interest in, at which time they are removed to the history file.

The history file, then, is the one used to do the analysis of marketing strategies, having the inquiry sources, the number of people who inquired, the number who applied and the number who enrolled, via each source.

Problems

A number of problems were discovered to have existed in this system, however. First, few people who inquired included their social security numbers, making comparisons to the admissions and registrations files difficult, if not impossible. The alpha key generated by the computer program was only really good for narrowing the possibilities to match people by hand, but otherwise was not capable of being used in matching files.

The second problem was that the school was only able to get in touch with about 5 to 7% of the people by telephone, either because of bad phone numbers or no information at all, and the entire telephone follow-up turned out to be largely a waste of time.

Another major problem was encountered when people who were currently enrolled at CCP inquired about information. This often occurs with part time students or students enrolled in community services or non-credit programs who may be interested in becoming full time students or enrolling at the main campus. Unfortunately, these people always got purged from the active file the first time through because they were already on the registration file. Therefore, follow-ups were never conducted on these people even though it may be that these are really the most interested in receiving more information and enrolling full-time.

Yet another problem occurred when junior high school students who want to receive mail and grandmothers who want their grandchildren to go to college send in newspaper coupons for information. Entirely too much time and expense was spent on chasing such less than serious inquiries.

These problems combined with the inordinately large numbers of people with whom we were dealing created tremendous expense with few results, so the entire system expanded and revised to try and cut down on waste.

REVISED INQUIRY SYSTEM

The first five steps of the original system still serve as the basis for the beginning of the new version, with a few changes:

- everyone who inquires for any information at all now receives the same packet of information, including a questionnaire which is coded with the alpha key developed by the program;
- the questionnaire asks for more detailed information, including social security number again, day and evening phone numbers, age, whether or not they have been enrolled at CCP

before, and whether or not they are high school graduates (see exhibit A.). Inquiries are asked to return these questionnaires if they would like to receive a catalog, application and course listing. It is made clear that nobody receives these items without the school having their social security number. It is hoped that in this way we will obtain information of those people who might be called "truly interested" in attending CCP.

Steps in the Revised Inquiry Process

The returned questionnaires are matched to the original inquiry system file by means of the computer alpha key and the data from the questionnaires and the inquiry file are combined for each record. These records make up the pre-admissions file. It is this file which is now used for further recruiting activities since it is smaller, more manageable, and contains people with more interest in attending CCP than those on the inquiry file.

The pre-admissions file is updated every week in much the same manner as the inquiry file had been: matching social security numbers to the admissions and registration files, checking the date the application and catalog were sent out to generate a telephone follow-up three weeks later, and checking the year and term of interest to see if they are enrolled by that time.

Two more follow-up steps were added. Some time after the telephone follow-up, a postcard is sent out if the inquiry has still not applied or enrolled. This has no return reply associated with it, and is simply a reminder (see exhibit B.).

After the start of the new semester, people who still had not enrolled who had indicated an interest in that term are mailed another questionnaire to determine their reasons for not enrolling CCP. These people are then all placed on the history file unless their returned survey indicates an interest in a future semester, in which case they remain active on the pre-admissions file (see exhibit C.).

Figure 1 shows a simplified flow chart of the revised inquiry process.

Figure 1

THE INQUIRY SYSTEM

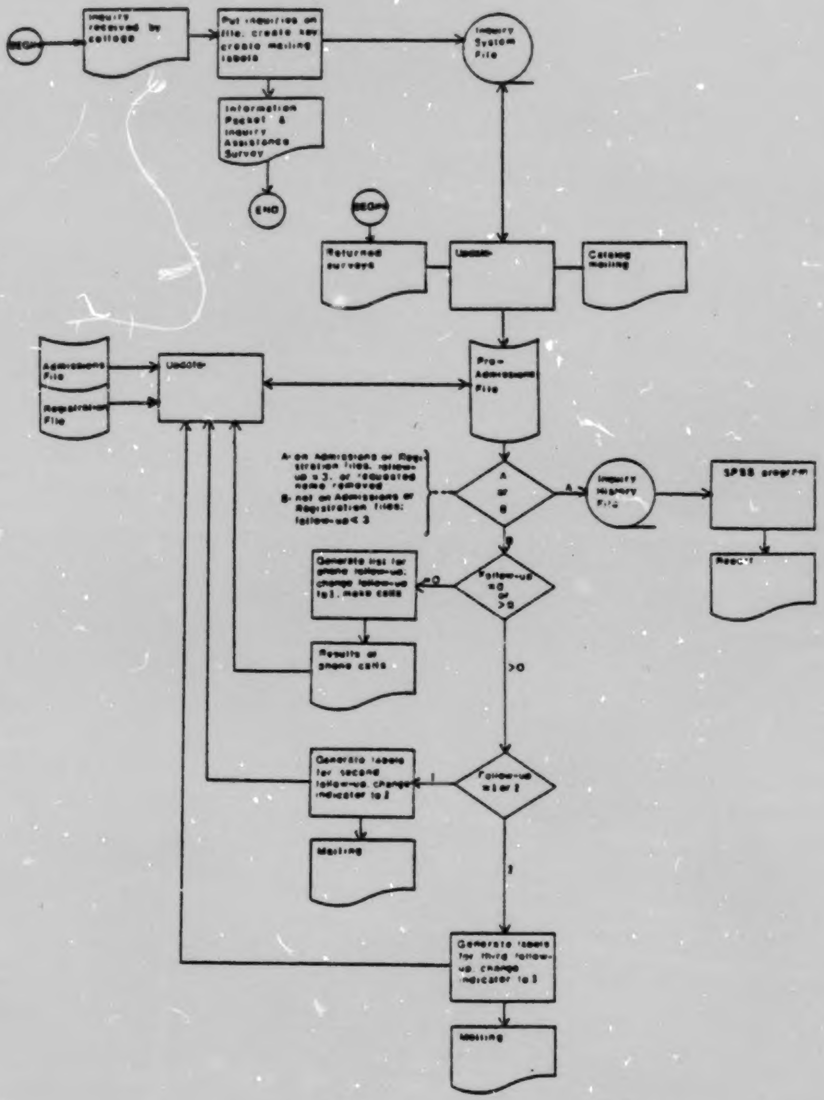
BEGIN
Inquiry received by college
Put inquiries on file, create key, create mailing labels
Inquiry System File
Information Packet & Inquiry Assistance Survey
END
BEGIN
Returned surveys
Update
Catalog mailing
Admissions File
Registration File
Update
Pre-Admissions File
A- on Admissions or Registration files, follow-up = 3, or requested name removed
B- not on Admissions or Registration files; follow-up < 3
A or B
A
Inquiry History File
SPSS program
Report
B
Follow-up =0 or >0
=0
Generate list for phone follow-up; change follow-up to 1, make calls
Results of phone calls
>0
Follow-up =1 or 2
1
Generate labels for second follow-up, change indicator to 2
Mailing
2
Generate labels for third follow-up, change indicator to 3
Mailing

Exhibit B

THANK YOU FOR YOUR INTEREST
IN COMMUNITY COLLEGE OF PHILADELPHIA.

WE ARE LOOKING FORWARD TO HAVING
YOU AS A CCP STUDENT.

OUR RECORDS INDICATE, HOWEVER, THAT
AS OF____ WE HAD NOT RECEIVED
YOUR APPLICATION.

IF YOU REQUIRE ANY ADDITIONAL
INFORMATION, OR IF YOU HAVE ANY
QUESTIONS PLEASE CALL OUR
CONTACT CENTER AT 751-8010.

THAT'S 751-8010. ASK FOR MS. LORAY.

THANK YOU.

BEST COPY AVAILABLE

Exhibit A

INQUIRY ASSISTANCE QUESTIONNAIRE

Please make corrections to your name and address as it appears at left:

alpha-numeric key
name ____________________________________
street address ____________________________________
city, state, zip code ____________________________________

- Social Security no. ____________________

- Day telephone # ______________ Evening telephone # ______________

- Date of birth ________ / ________ / ________

- Are you a high school graduate?

_____ yes
_____ no

- Are you currently enrolled at the Community College of Philadelphia?

_____ yes
_____ no

- Have you ever been enrolled at the Community College of Philadelphia?

_____ yes
_____ no

- When do you plan to begin your studies at Community College of Philadelphia?

_____ fall term (September)
_____ spring term (January)
_____ summer term (May or July)

- At which location do you plan to attend Community College of Philadelphia?

_____ main campus at 17th and Spring Garden Streets
_____ at a neighborhood (community services) location
_____ at home by means of television courses

- What is your first choice for a major field of study at Community College of Philadelphia (see codes on other side of form).

____

- What is your career goal?

____

- Would you like someone to contact you about any of the following? (Please mark all that apply)

_____ a tour of CCP's main campus
_____ counseling before admissions
_____ receiving a college catalog

- Would you like additional information about any of the following? (Please mark all that apply)

_____ courses that are not for college credit
_____ courses, both credit and non-credit, that are offered in your neighborhood
_____ courses offered on television

Exhibit C

COMMUNITY COLLEGE OF PHILADELPHIA

INQUIRY FOLLOW-UP

Thank you for your interest in Community College of Philadelphia!

Our records indicate that although you expressed interest in attending CCP this semester, you have not enrolled. So that we may be able to plan our programs to best suit the needs of the community, will you please answer the following questions concerning your reasons for not attending CCP?

Thank you very much for your cooperation.

- Did you receive all of the information you requested from CCP?

_____ yes, promptly
_____ yes, after a while
_____ no ----> What information did you not receive? ____________________

- If you spoke with any person here at the college, please indicate your response to each of the following items concerning that person.

	Agree	Neutral	Disagree
This person knew what they were talking about.	_____	_____	_____
This person was rude.	_____	_____	_____
This person was helpful.	_____	_____	_____
This person did not understand what I was looking for.	_____	_____	_____

- Are you planning to or are you now attending another school or college instead of Community College of Philadelphia?

_____ no
_____ yes

- If yes, what is the name of the other school or college?

_____ Temple
_____ St. Joseph's
_____ Drexel
_____ other (please list) ____________________
_____ LaSalle
_____ University of Pennsylvania
_____ Thomas Jefferson

- Do you plan to enroll at CCP in the future?

_____ yes ----------------------> _____ spring (January)
_____ no _____ summer (May or July)
_____ not sure _____ fall (September)

- Please check which of the following reasons made you decide not to attend Community College of Philadelphia this semester.

_____ financial difficulties
_____ the program I wanted was not available
_____ personal or family difficulties
_____ transportation problems
_____ classes not held at convenient times
_____ conflicts with my job
_____ the courses I wanted to take were not available
_____ CCP was not my first choice
_____ I got a job
_____ I decided not to attend any school at this time
_____ other (please describe) ____________________

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It is again the history file which is used in the analysis of marketing strategies. Table 1 shows the number of inquiries, applicants, and enrollees by each inquiry source.

Table 1
INQUIRIES, APPLICANTS AND ENROLLEES BY INQUIRY SOURCE

Inquiry Source	Inquiries	Applicants	Enrollees
Contact Center	2298	2013	1322
Information Center	1283	1048	698
Admissions Office	742	707	508
Registrar's Office	222	61	30
Viewbook	210	192	38
November Ed Guide	131	113	100
Division Brochures	84	67	20
April Ed Guide	26	24	0
Business Reply #2	25	24	4
High School Letters	6	3	2
18 Almanac	4	4	3
Catholic Ed Guide	2	1	0
PSAT Letters	2	2	2

CONCLUSIONS AND MORE PROBLEMS

There are still problems with this system, however, not the least of which has been in implementation. Since this system requires the cooperation of so many departments in the college, coordinating all of them has been difficult, and the new version of the system is just now being put into place.

A major problem in analyzing the results is the fact that "admissions office" is really quite a different thing than "high school mailing". That is, "admissions office" is not really a marketing strategy, although it is to some extent an inquiry source. There is still some debate as to whether or not these kinds of sources should be included, or if there should be some effort to further define where people hear about our school.

Another problem to take into account is that although high school mailing generated 4 inquiries, all 4 of whom enrolled, a missing factor is that 1500 letters were sent out in the first place, and only 4 inquiries were generated.

Overall, however, the system has been useful in generating follow-ups to prospective students and in at least providing us with some figures about and insight into our marketing strategies.

FOCUSING ON A NEGLECTED COMPONENT OF THE STUDENT SELECTION PROCESS:

A STATE-WIDE SURVEY OF HIGH SCHOOL GUIDANCE COUNSELORS

Jill F. Campbell
Louis M. Spiro
Office of Analytic Studies
S.U.N.Y. College at Brockport

ABSTRACT

This report discusses the overlooked importance of high school guidance counselors during the information and inquiry stages of students selecting colleges. A state-wide population survey of all 3,250 high school counselors was conducted with an overall response rate above 20% (660 useable surveys). This paper focuses on the portion of the survey which elicited quality estimations of four criteria for fifteen institutions. From the data, an institutional image baseline was developed. It will serve as a comparative baseline in successive years as the State University of New York, College at Brockport attempts to increase standards and to improve the quality of its entering classes.

INTRODUCTION AND PERSPECTIVE

Brockport is part of the 64 campus State University of New York (S.U.N.Y.) system. As one of twelve four-year Arts and

Sciences colleges in the system, there is little differentiation in regards to "cost of attending" and "financial aid packaging". Also, the availability of programs is almost universal. A matrix of program overlap indicates that nine of eleven campuses overlap 35 of our 39 program offerings by more than 50%. In addition, applications for admission are not made directly to this institution. Rather, they are sent to a central applications processing center. Students are allowed one college choice for the basic application fee and then must pay $10 for their credentials to be sent to each additional college. This discourages most students from listing several colleges. So, bearing in mind that for all practical purposes the college is unable to develop a competitive edge regarding cost, financial aid packaging and program uniqueness, it is critical that this institution is considered for designation as one of the top choices on the application form. Otherwise, for all intents and purposes, it is out of the initial consideration set. In addition, this college is experiencing an enrollment decline which began in 1976 and is continuing through Spring 1983.

For the reasons stated above, it is crucial that this institution concentrate on improving its communications with college-bound high school students. This is where the high school guidance counselors are important to admissions recruiting strategies. They can serve as a liaison and, expressly, as an excellent source of information in the primary stage of the student selection process. Counselors influence whose catalogues are shown and they can narrow or define students' choices as they make recommendations.

PURPOSE

In this paper, it is our intention to focus on the comparative quality profiles of different types of institutions as reflected by high school guidance counselors in a state-wide survey conducted in May-June 1982. The types of institutions being compared included both public and private four-year universities and colleges and two-year agricultural and technical colleges. Quality assessments of faculty, programs, students and selectivity were made. Regional, as well as, state-wide comparisons were developed to allow for monitoring changes in particular geographic areas of interest.

Specifically, from the survey data collected we developed a current image or college profile to serve as a comparative baseline as the college tries to increase the quality of its entering classes. It is recognized that in the past this institution was perceived as a school of last resort. Admissions criteria were very liberal and many students were accepted who had been denied at other SUNY colleges. But, that is no longer the case. For Regular Freshmen since 1979, the mean High School Average has increased three points and the total mean SAT scores are up nearly 60 points. Now students are denied admission to Brockport when they have been accepted at one or more of the other SUNY Colleges. With an established baseline, we can monitor changes in the external image as we actually improve quality through increasing standards and selectivity.

LITERATURE REVIEW

A review of the literature reveals an abundance of material relating to student choice of colleges. Many of the studies related to prospective students, i.e., students who applied, were accepted and either enrolled or declined acceptance (Hollinger, 1978; Lay and Maguire, 1978; Meganathan, 1979). Yet, another study included an annual survey of the entering freshmen to monitor the college's image and the impact of policy changes (Stern, 1979).

But, according to Kotler, in "Applying Marketing Theory to College Admissions" (1976), high school students go through a seven stage process before finally enrolling at a particular institution. From our perspective, stages II (information seeking and receiving) and III (specific college inquiries) are of particular importance. This college needs to communicate a positive image of the campus during these two phases. Literature supports increased contact with high school counselors to further the admissions effort, particularly during the information gathering and inquiring periods. As mentioned in "Multicampus Education from a Marketing Perspective", (Kotler, 1978) one means of accomplishing this is through improving the contact with high school counselors. He also lists them as one of the five personal sources from whom students gather information. Then, in the Penn State Study "How College Students Select a College"

(Gilmour, Spiro, Dolich, 1978) higher ability students seemed to rely more on guidance counselors as their primary source of information. And, furthermore, Litten, in "Different Strokes in the Applicant Pool: Some Refinements in a Model of Student College Choice" (1982), stressed the importance of maintaining contact with guidance counselors in geographic areas in which the level of parental education is low. Students in these areas require greater assistance from counselors during the information seeking and inquiring stages.

For all the importance of high school counselors, in reviewing the literature, studies of this group are scant, indeed. In essence, we recognize the importance of high school guidance counselors and the absence of major studies conducted utilizing this group.

DATA SOURCES

The major data source was a state-wide survey of high school guidance counselors. It consisted of a four-page pamphlet. The first two pages addressed communications between Brockport and the guidance community; estimations of quality in terms of faculty, programs, students and selectivity for each of fifteen institutions; quality of specific program areas at Brockport; image impressions derived from multiple sources; types of students typically recommended to Brockport; high school application and matriculation trend data for Brockport; and finally, an evaluation of Brockport graduates. The third page consisted of demographic information on the size of the graduating class; continuing education; distances from Brockport; whether or not the counselor was ever enrolled or visited Brockport; sex; age group; and schools from which the counselor received undergraduate and graduate degrees. The entire fourth and final page was left open for comments and suggestions. The survey project, completed in August, 1982, was part of a research component requested by a marketing consulting firm contracted by Brockport to investigate and address its enrollment difficulties.

METHODOLOGY

The survey instrument was developed in collaboration with the President's Staff and the marketing consultant. It was finalized and sent to 3,250 high school guidance counselors along with a cover letter from the President and a postage paid return envelope. Upon receipt of a response from a counselor, a thank you note from the President was mailed. A follow-up postcard was sent to non-respondents about three weeks after the initial mailing. A total of 660 valid returns resulted in a response rate of 20%. Surveys were coded and a Command and Edit (CANDE) file created on the Burroughs 6800. Statistical analyses, i.e., frequencies, crosstabs, mean, etc., were performed using the Statistical Package for the Social Sciences (Nie et al, 1979). Additionally, a meeting was held with the President and several other "key" individuals to determine specific desired outcomes from the analysis. This refined the direction of the survey analysis which was finalized during the distribution, collection and file creation phases.

This paper focuses on the survey portion which elicited ratings, utilizing a five point scale, of the quality of four criteria: faculty, programs, students and selectivity for a comparison of Brockport with fourteen other institutions. Types of institutions listed for comparisons included: eight other SUNY four-year Arts and Science colleges; two SUNY two-year Agricultural and Technical schools; two SUNY University Centers; one four-year private college; and, one private university. Public institutions were chosen based on known competition levels. Using a scale of 1-5, with 1=excellent, 2=good, 3=average, 4=below average, and 5=poor, the responses were tabulated for the four criteria. Then, a 60-cell matrix was developed. Each cell contained the State overall mean score for each of the four criteria by institution (see Table I). Next, we used this matrix to examine the six non-redundant dimension pairs: faculty/programs, faculty/students, faculty/selectivity, programs/students, programs/selectivity and students/selectivity. Then we plotted the means for each of the six groups for each institution (see Tables III-VIII). Finally, we computed the correlation coefficients for each dimension getting a very high positive value in each case (see Table II). The matrix and the dimension graphing served to determine at a glance Brockport's position regarding perceived quality in relation to the other institutions. It also illustrated the group of colleges with which we are placed.

TABLE I: New York State Quality

Institution	Faculty x Rating	Program x Rating	Students x Rating	Selectivity x Rating
1. SUNY College at Brockport	2.3	2.4	2.8	2.9
2. SUNY Arts & Science College	2.2	2.2	2.5	2.6
3. SUNY Arts & Science College	2.2	2.2	2.4	2.4
4. SUNY Arts & Science College	2.2	2.2	2.5	2.6
5. SUNY Arts & Science College	2.1	2.1	2.3	2.3
6. SUNY Arts & Science College	2.4	2.4	2.8	2.8
7. SUNY Arts & Science College	2.1	2.2	2.3	2.3
8. SUNY Arts & Science College	2.1	2.2	2.3	2.3
9. SUNY Arts & Science College	2.2	2.2	2.5	2.5
10. SUNY Ag & Tech	2.3	2.2	2.9	2.9
11. SUNY Ag & Tech	2.2	2.1	2.7	2.8
12. SUNY University	1.6	1.5	1.6	1.5
13. SUNY University	1.7	1.6	1.7	1.7
14. Indep. College	2.0	1.9	2.2	2.2
15. Indep. Univ.	1.9	1.8	2.1	2.2

TABLE II: Correlation of Dimension Pairs

Faculty/Programs	Faculty/Students	Faculty/Selectivity
+ 0.97	+ 0.96	+ 0.99
Programs/Students	Programs/Selectivity	Students/Selectivity
+ 0.91	+ 0.90	+ 0.99

TABLE III: Group Means for the Faculty/Programs Dimensions

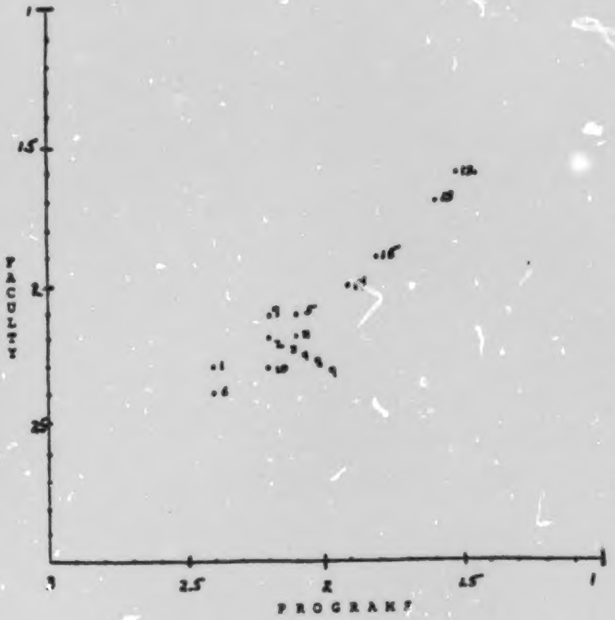

TABLE IV: Group Means for the Faculty/Student Dimensions

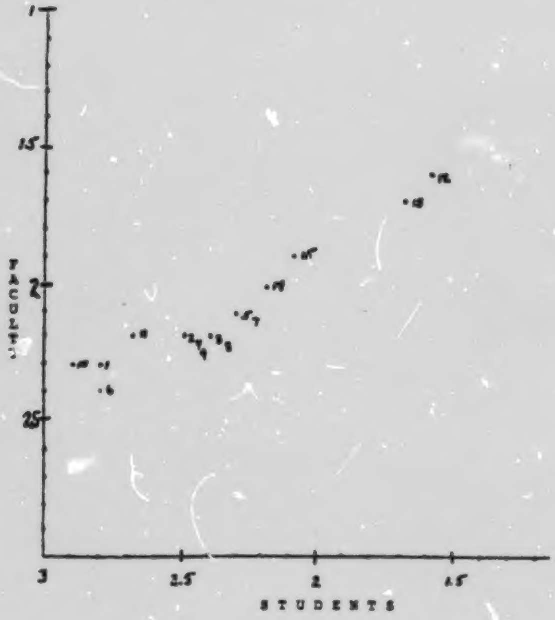

TABLE V: Group Means for the Faculty/Selectivity Dimensions

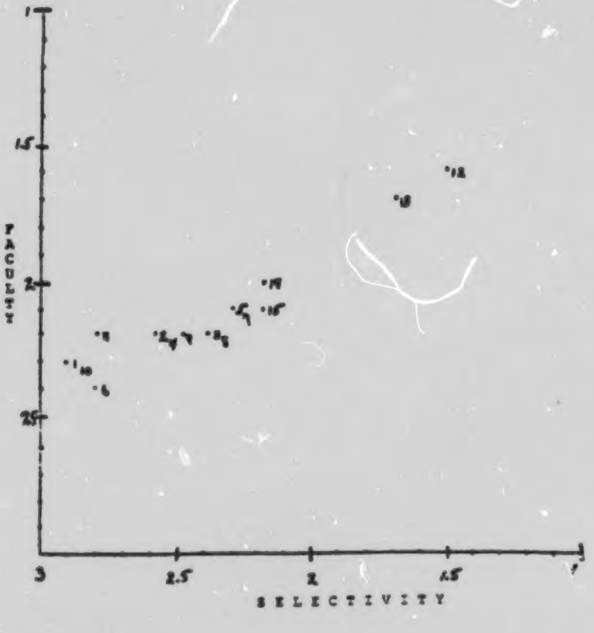

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TABLE VI: Group Means for the Programs/Student Dimensions

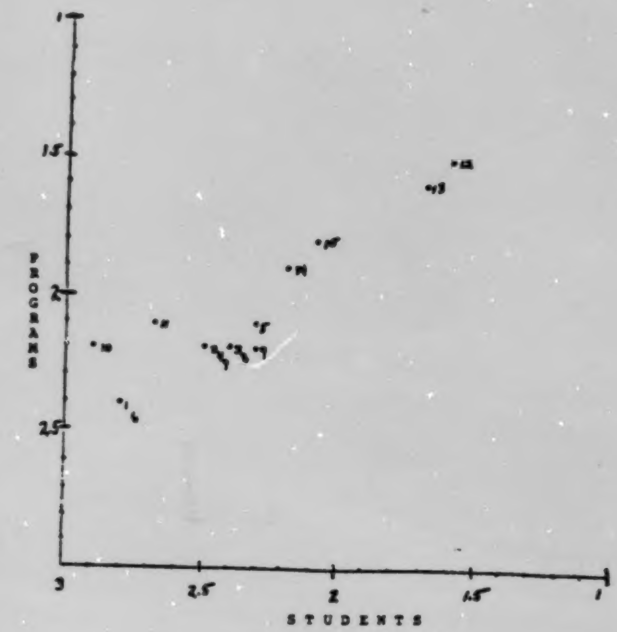


TABLE VII: Group Means for the Programs/Selectivity Dimensions

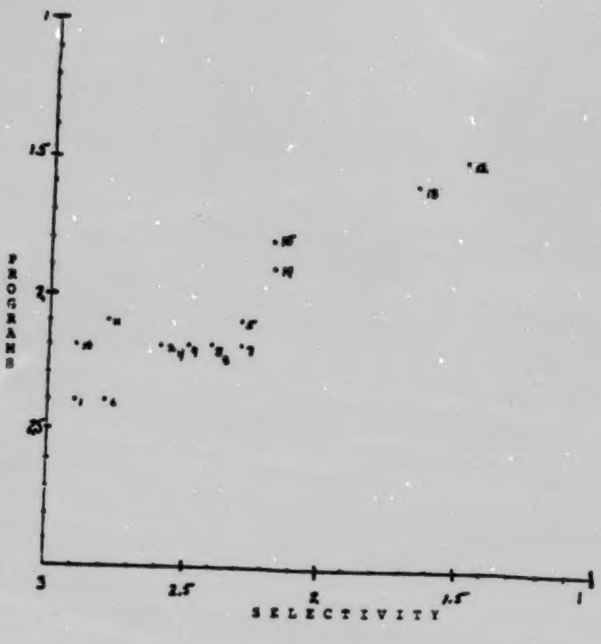
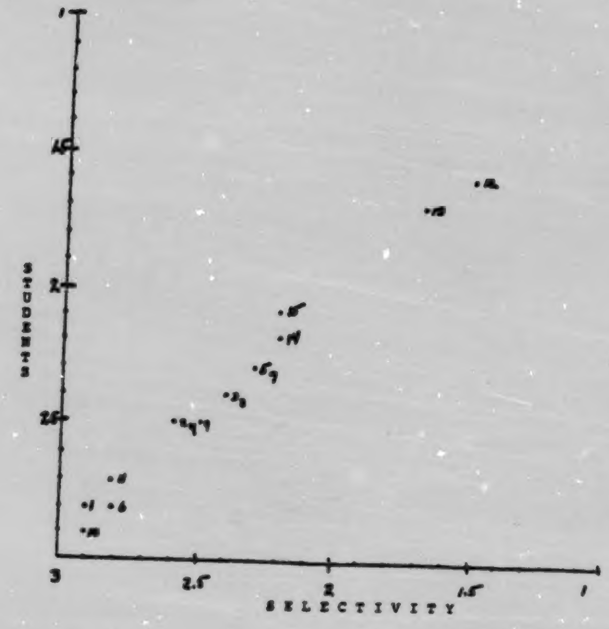


TABLE VIII: Group Means for the Students/Selectivity Dimensions



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RESULTS/RECOMMENDATIONS

The results of the dimension pairs examination were quite interesting. The means for all institutions were at least average or better. None were below average or poor in any category. Consistently, certain institutions formed clusters. The two SUNY university centers fared the best in all categories. The independent college and university received the next highest quality rating along with two of the nine SUNY Arts and Science Colleges. The third cluster consisted of five SUNY Arts and Science Colleges. The last cluster consisted of two SUNY Arts and Science Colleges and, for three of the pairs, one of the SUNY Ag and Techs. The other SUNY Ag and Tech College stood alone on three of the six variables and was categorized in different clusters for each of the other three variables.

And where did Brockport fall? The perceived image consistently placed Brockport in the lower cluster. State-wide mean quality scores for Faculty and Programs were both "above-average" 2.3 and 2.4, respectively, but not "good". Since the local on-campus perception is one of "university quality faculty and excellent programs", Brockport has a long way to go to change the guidance community's perception to more accurately reflect what is considered reality internally. State-wide mean quality scores for Students and Selectivity were only slightly better than "average" 2.8 and 2.9, respectively. Since higher admissions standards have been adopted recently and selection has resulted in higher quality students, it is important that this message is conveyed quickly to guidance counselors so they can make appropriate recommendations to their college bound high school students.

Having developed a quality profile in relation to the fourteen other institutions, we also isolated other colleges with similar images. Simultaneously, we identified the colleges with whom we would like to be positioned. The immediate goal is to be perceived as one of the higher quality Arts and Sciences Colleges, and the ultimate aim is to be positioned with the SUNY University Centers. If the counselor's quality assessment for Brockport were to be modified sufficiently to move us into either one of those clusters, then the external image would more closely match the internal quality assessment.

In order to advance, this institution needs to improve its image among its clientele. College admission counselors can effectively enlist the assistance of high school guidance counselors to further this goal. This can be accomplished by keeping them current with updated catalogues, a newsletter, an expanded schedule of high school visits, by expanding the number of sites for high school college nights, more personal contacts, and feedback on their students who eventually enroll. It would be difficult to do this for every high school in the State. Survey results document differentiation regarding quality profiles within regions of the state, e.g. Northeastern, Central, Western, etc... Brockport received lower ratings of quality in the Genesee Valley Region in which it is geographically located.

This indicates a need for substantial public relations/communications work in our "own backyard" to increase perceptions of quality. Therefore, we recommend that marketing be conducted on a regional basis. We also recommend that this survey be conducted annually late in the Fall Semester or early in the Spring Semester to monitor changes in college policies and external quality assessments. Since the last survey, there have been a multitude of policy changes. It would be most opportune to repeat this survey early in Spring 1984 to determine if our internal changes are reflected in our external image.

IMPLICATIONS

The value of this study is based upon its nature and scope. It takes into consideration the estimations and expertise of an underutilized group, high school guidance counselors, to profile the quality of fifteen colleges using four criteria. Ultimately, it allows recommendations for marketing strategies for Admissions recruiting and enrollment management, and for the continual evaluation and refinement of these activities.

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THE ROLE OF RESEARCH IN MARKETING

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"The aid of marketing is to know and understand the customer so well that ...the service fits him and sells itself," says Peter Drucker in Marketing for Non-Profit Organizations.

It is in this context that a College-wide committee approached the project of developing a marketing plan for Brookdale Community College. We do not see it as a narrow focus on strategies for recruiting students, publicizing courses and promoting programs.

For direction we borrowed heavily from Philip Kotler in his comprehensive texts, Marketing Management and Marketing for Non-Profit Organizations. As we attempted to apply Kotler's prescriptions to our problems it became very apparent that we have a great need at Brookdale for more complete and detailed information on the markets we are committed to serve. Hence, many of the recommendations are aimed at providing valid information as a basis for future planning.

This comcept of marketing is in perfect phase with Brookdale's philosophical commitment to be responsive to the needs of our community. But effective marketing requires more than an attitude of responsiveness...it calls for a systematic and objective technology for guiding the responses. Kotler argues that the critical issue is not one of whether or not to become involved in marketing, but rather, how thoughtful and orderly the process should be. We believe it should be highly reasoned and based on as much good research information as we can afford to gather.

The Committee's recommendations fell into four categories from the broader and longer-ranged to the more specific and immediate:

I. POLICIES. . . establish Brookdale's long-range marketing stance and degree of commitment.

II. GOALS. . . provide a focus for the market planning function three to five years ahead.

III. OBJECTIVES. . . set priorities for a two-year period.

IV. ACTIVITIES. . . specific things the College should do.

The Committee followed Kotler's outline of a suggested systematic marketing audit to carry out an informal self-examination of Brookdale's current marketing efforts. The outline is very comprehensive, requiring that the Committee address forty-five questions. It proved to be a useful exercise in many ways, but it was particularly helpful in focusing attention on the lack of hard factual information to guide Brookdale marketing decisions. Many of the Committee's recommendations for research and data analysis stemmed from this exercise.

As essential base for market planning is a clear identification of the groups of people upon whom the enterprise depends for success. Every organization operates in an environment of its "publics." Kotler defines a "public" as a distinct group of people and/or impact on an organization. Using this definition, the Committee developed a working list of Brookdale's nineteen publics:

Students
Former Students
Prospective Students
Families of Students and Prospective Students
Community Service Program Participants
Suppliers of Goods and Services
Faculty of the College
Other Staff
Management (President's Staff)
Board of Trustees
Board of Chosen Freeholders
Regulatory Agencies
Monmouth County Educational Community
Higher Education Community (National)

Mass Media (Local)
Business Community
Political Leaders
Community Leaders
General Public of Monmouth County

Markets may be profitably examined by products. Who buys each? Who buys most intensively? What are their behavioral characteristics. Who is our competition?

1. Credit
2. Community Services
3. Community Use of Facilities
4. Career Services
5. Student Activities and Athletics
6. Media Services
7. Computer services to other organizations
8. Brookdale Foundation Trust (Scholarship and other fund raising)
9. Alumni Services

The development of marketing strategies within any organization depends on a clear understanding and evaluation of the existing market situation. Situation analysis can reveal major practices, problems, and opprotunities facing an organization and serve as a basis for more effective planning. The first task in this process is to establish the status of three significant factors - markets, consumers, and competitors. Brookdale lacked much basic, reliable market information and the Committee identifies the most urgently needed information in the Recommendations section of this report. The following situation analysis attempted to organize and consolidate the research and information already available on Brookdale Community College markets, consumers, and competitors.

Market

1. Market Share	
a. % of County Residents	In 1981, 2.31 percent of the County population enrolled at Brookdale. The New Jersey State average was 1.9 percent. In 1980, of all the County residents attending college in New Jersey on a full-time basis, 32.9 percent selected Brookdale; 75.9 percent of County residents attending part-time selected Brookdale.
b. % of High School	Since 1975, the percent of County graduates enrolling at Brookdale has been around 15 percent. Of the high school graduates going on to College, 24 percent enrolled at the College. These percentages represent 1329 high school graduates in 1980.
c. Market Attitudes	The 1982 Citizens' survey indicated that 90% of the County knew about Brookdale and 97% expressed satisfaction with the College's services.
2. Market Geography	In Fall 1981, more than 3348 off-campus students generated 10,202 credit hours at 16 sites.
3. Market Trends	
a. Decline in High School Graduates	It is estimated that the number of graduates of Monmouth County High Schools will decline by 15.5 percent from 7,100 in 1981 to 6,000 in Fall 1985.
b. Ethnicity	The percentage of Black, Hispanic and Asian enrollments is expected to remain at 13.4 percent of the total College enrollment through 1985.
c. Age	The percentage of students over 22 is expected to remain at about 60 percent through 1985.
d. Part-Time	The percentage of part-time students is expected to remain at about 70% through 1985.
e. Tuition	Tuition for County residents has increased from $13.50 per credit hour in 1969 to $23.00 per credit hour in 1982. The current State maximum per credit hour is $25.00.

f. Financial Aid	In 1981-82, 2240 students received $2,566,595 in student assistance. The impact of proposed changes in Federal financial assistance criteria and grants has yet to be determined.
g. Decreased State Revenue	The portion of State aid to community colleges has steadily declined. There was no increase in State aid to colleges for FY1983.

Student Consumers

1. Enrollment	The total College enrollment for Fall 1981 was 11,719. Non-credit enrollments in 1981-82 totalled around 10,000.
2. Curriculum Preferences	Enrollment in career programs comprised 51 percent of the total in Fall 1981.
3. Fall to Winter Attrition	Winter enrollments have, since the beginning of the College, comprised around 91.5 percent of Fall enrollment.
4. Student Attitudes	The Winter 1981 Attitude Survey results indicated that almost 90 percent of enrolled students have expressed satisfaction with Brookdale.
5. Continuation Survey	The 1980 Continuation Survey indicated that 70 percent of the students who did not return to Brookdale are employed.
6. 9-Month Graduate Survey	The 1980 Graduate Survey revealed 44 percent employed full-time, 75 percent of whom feel that Brookdale's preparation was necessary for them to secure their current job. 52 percent were continuing their studies.

Competition

1. Other Colleges	In Fall 1980, the distribution of first-time full time Monmouth residents was as follows: Brookdale, 1479; Rutgers, 355; Monmouth, 159; Trenton State, 136; Montclair State, 130; Stockton State, 90; Glassboro State, 84; Seton Hall, 83; Kean, 61; and Rider, 54.

2. Price (1981-82 Average Annual Tuition and Fees)

Brookdale	$ 610.00
Mercer	640.00
Middlesex	680.00
Ocean	690.00
Rutgers	1,312.00
Trenton	1,031.00
Montclair	1,058.00
Stockton	1,065.00
Glassboro	1,038.00
Seton Hall	3,885.00
Monmouth	4,580.00
Kean	1,020.00
Rider	3,600.00

The Citizens' Survey

The problem of communicating with the people of Monmouth County has been a significant one for Brookdale. The community is heterogenous with its half-million residents in 195,000 households in 53 towns in communities that range from posh shore-front enclaves to desperate blighted ghettos and open farm lands. Local media reach less than half of the households and Brookdale rarely has access to New York, Newark and Philadelphia media that penetrate the County heavily.

It was important to learn the current level of knowledge about the College, support for the College programs and public ideas regarding program development in the 1980's. Specifically, the College needed to know the answers to the following questions:

1. Are there differences in knowledge of and support for Brookdale by resident areas? Do people residing nearer the campus have more positive perceptions of the College?
2. Are there differences in knowledge of and support for Brookdale by household income? Does the College receive its greatest support from middle-income households?
3. Are there differences in knowledge of and support for Brookdale by such demographic indicators as age, sex and ethnicity? Are ethnic minorities supportive of Brookdale?
4. Are there educational needs which the College has not yet identified?

A survey was mailed to every household in Monmouth County during the Winter 1982 term. A total of 11,435 responses were received. This total constituted 5.9 percent of the surveyed population of 195,320 households. The response was significantly better than the anticipated 3 to 3.5 percent.

The survey respondents were an older population than actually exists in Monmouth County or at Brookdale. This fact is not surprising, given the assumption that the survey would most often be completed by adults.

The following broad observations, relevant to marketing have been made:

1. Consciousness of Brookdale is high. 9 out of 10 respondents had either heard about, attended or used the services of the College and this was true County-wide. The higher the income the higher the percentage of knowledgeable people. Younger respondents are somewhat more aware of the College than older ones, but the difference between the youngest age group and the oldest is only six percentage points. Blacks and Hispanics have a lower awareness than Whites and Asiatics, men lower than women.

2. Brookdale is best known for providing the first two years of a four-year college (65%), but almost as many (55%) know Brookdale as a source of non-credit courses. Younger people are much more inclined to think of Brookdale as the "first two years of college." Conversely, older people are more likely to associate Brookdale with non-credit than are younger, and higher income more likely than lower. The College is less well-known for non-credit offerings among minorities.

3. Of people who have experienced Brookdale, most are satisfied. 86% of the oldest age group and 73% of the youngest expressed satisfaction. Only a very small percentage, 2% to 3%, expressed dissatisfaction. Fairly large percentages of the younger age groups were either neutral or had no opinion. There seems to be no relationship between ethnicity and satisfaction, but women seem to be better satisfied than men and the more affluent better satisfied than the less affluent.

4. Services of the College (other than credit courses) have been used by about seven out of ten respondents. Women are heavier users than men. The most popular use was cultural events with non-credit courses, the library and student trips all included in the top five. Almost one-quarter of the women had used the Women's Center and over one-third of the men used the athletic facilities (possibly inflated). There is a tendency for use to be somewhat lighter among the youngest age group, the oldest age group and minorities. Use increases as income rises. Cultural events, the Women's Center and athletic facilities are those most heavily used by the higher income groups. Career Services, Testing and Assessment and the LRC are most heavily used by lower income people.

5. People have learned about Brookdale mostly through our mailings. 81% of the women and 75% of the men identified direct mail to their homes as a means of learning about courses, programs, services and facilities of the College. Students and former students are the next most important source of information, followed by other word-of-mouth channels and the newspapers, although newspapers are mentioned only half as

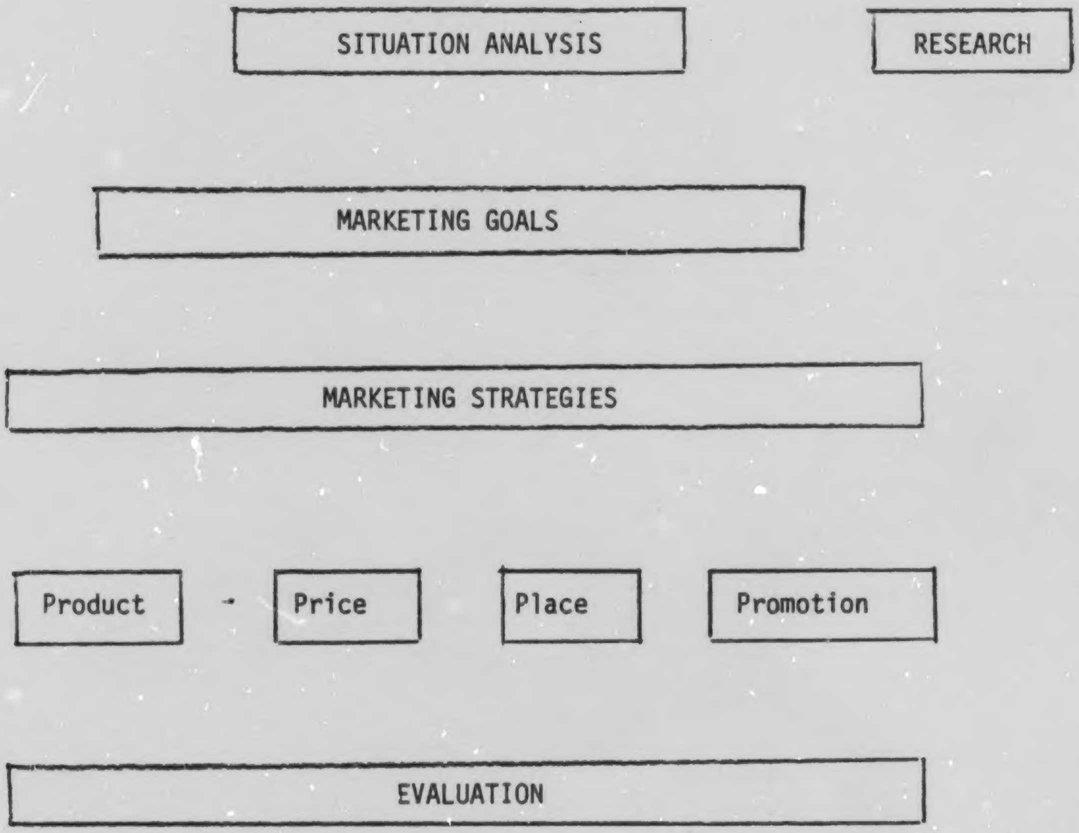
frequently as direct mail.

6. Reasons why people have not used the College are almost impossible to get at with this kind of survey. It is not possible for us to do anything about three most frequently given reasons - "Time", "Money", and "Work"; so, it makes little difference. One reason given that we might be able to relieve in some way is "Transportation", which was mentioned by only 8% of the sample.

7. Most people have no opinion as to whether Brookdale is meeting the needs of the county adequately. Almost 65% had nothing to say on this point. Those who answered are about evenly divided on the question.

A MARKETING PROCESS FOR BROOKDALE

(to be applied to each of the identified products of the college)


SITUATION ANALYSIS
RESEARCH
MARKETING GOALS
MARKETING STRATEGIES
Product
Price
Place
Promotion
EVALUATION

Research, Analysis and Goal Setting

In the research step, the beginning of the process, necessary information on product and market is gathered from a wide variety of sources. This is combined and organized in a meaningful way in the Situation Analysis to provide information to guide the decision makers in establishing Marketing Goals for each product.

Marketing Strategies and Activities

Research and the agreed-upon Marketing Goals provide the basis for developing Marketing Strategies and the Activities through which they will be implemented. The Strategies are made up of various configurations...the most widely used being product, place, price and promotion.

Product	Courses, programs, people, services and facilities offered by the College that are purchased by and benefit the consumer.
Place	Location, time, and type of instruction or other offerings made available and accessible to consumers.
Price	Consumer investments of money, effort and time in exchange for a College product.
Promotion	Communications designed to provide adequate information upon which consumer can make informed decisions about College products.

The Strategies organization provides the framework for the development of specific Marketing Activities. For each activity, a separate worksheet must be developed. This would indicate the target population, the need, the goal, the activity outlined in detail, the completion date, the office responsible, a plan of action together with deadlines, success indicators and the cost both in dollars and personnel. (See sample attached)

These would be ranked or grouped in priorities by the Marketing Control Board so that efforts of all appropriate units could concentrate on these activities with the highest priorities.

PREDICTING THE LIKELIHOOD OF MATRICULATION FOR COLLEGE APPLICANTS

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INTRODUCTION

Qualified students are essential to the success of a university. Competition for such students has become more intense in recent years due to the decrease in college-age population, and promises to further intensify as this trend persists through the 1990's (Centra, 1980). To survive in this environment, universities must be able to accurately predict enrollments, and effectively influence student choices.

During the period of increasing high school graduates which ended in approximately 1980, Northeastern University was modestly successful in predicting freshman enrollments (Perry and Goncalves, 1982). But passively predicting enrollments and then reacting to them is really not a fruitful strategy for the future because of the severely dwindling pool of applicants predicted over the next decade. The universities which survive will engage in aggressive and effective marketing campaigns, euphemistically referred to as recruiting efforts by higher education. College education attributes will be altered, within limits, in response to consumer preference. Such attributes will include physical characteristics of the institution, tuition charges, scholarship funds, appeal to specific minority groups, and less tangible image determining factors. To do this, one must first identify those key attributes which affect student choices.

Admissions offices have responded to this need by a variety of marketing efforts such as additional site visits, increased mailings, wider geographical boundaries on recruitment, scheduling of faculty and staff for meetings during applicants' campus visits, and increased emphasis on quality of publications. Surveys have been performed on both matriculants and non-matriculants to evaluate the average effectiveness of such efforts. To accomplish this, budgets for admissions offices have increased much more rapidly than overall institutional budgets.

In response to this changing environment, the focus of our efforts at Northeastern University has shifted from predicting college enrollments by extrapolating high school data to prediction of matriculation using the applicant pool as a base. This is not unlike what the admissions department currently does primarily in a qualitative way. Relatively little is known in a quantitative way about what influences students to come or not to come to Northeastern. The objective of the work reported here is to identify those attributes, both hard variables and perceptions, which distinguish between the matriculating and non-matriculating student for Northeastern.

To our knowledge, there has been little effort devoted to the development of a stratified marketing approach using different types and levels of effort for differing groups of applicants. To do this one must first determine if attitudinal and socio-economic variables can be used to predict matriculation of applicants. Our results show that knowing certain facts about an applicant allows prediction of the matriculation decision with a high probability of success. This implies that a formal admissions policy which initiates differing strategies depending on the estimated probability of matriculation could improve the efficiency of the admissions office, and more importantly, could result in an increased number of matriculants. The research contained herein satisfies the goal of demonstrating that responses to a short questionaire can be used to successfully classify matriculation decisions. The next step would be to use thses results in developing a stratified admissions policy.

APPROACH TO MATRICULATION PREDICTION

Initial Effort

It is desirable to find a minimum set of attributes defined by an existing data base which accurately distinguish matriculant from non-matriculant. This would minimize the cost of prediction. Consequently, we began with data already collected as part of the admissions process. These data include SAT scores, high school rank, interview results, tuition deposit status, advanced standing status, major, city and state, etc.

Analyses were performed on the admissions files for freshman who enrolled in 1981 and 1982. Multivariate regression and discriminant techniques demonstrated very low correlations between these variables and the matriculation outcome. Further, the lack of complete data sets prevented any conclusive results.

Having determined that existing data alone were inadequate for our purposes we set about the task of devising an instrument which would efficiently and accurately elicit from applicants perceptions about Northeastern University as well as socio-economic information. There is much in the literature to suggest the potential for relationships between these factors and matriculation. Krampf and Heinlein (1981) distilled seven predictor variables from over 100 items to predict matriculation at a small midwestern university. Willingham and Breland (1982) studied the problem from both perspectives: factors which influence students to select particular institutions , and factors, in addition to academic performance, which influence universities to admit particular applicants. The work by Maguire and Lay (1981) provides a thorough examination of predicting matriculation from survey data. In addition, the second author provided valuable assistance in the early stages of the Northeastern questionnaire development.

The first questionnaire was mailed to applicants for the entering freshman class of 1981. It consisted of 25 questions (108 items) on two standard letter size pages printed both sides. It was planned to have the questionnaire to the applicants by early August to insure that non-matriculants who would be leaving home for college in the Fall would receive it. But, due to logistical problems the mailing did not take place until February 1982. This had an impact on both the response rate of non-matriculants and the stated perceptions of the matriculants, who by then had experienced their first quarter at Northeastern. The second annual cycle of the questionnaire occurred for the entering freshman entering class of 1982. The timing was more appropriate, being mailed to applicants in late August of 1982.

The population surveyed consisted of the total yearly applicant pool of approximately 12,000 students: 8000 non-matriculants, and 4000 matriculants. This approach was certainly more expensive than a random sample, but was held to a not excessive cost through the use of paid permit bulk mailing. More importantly, since the characteristics of this population were so totally unknown, including the likely response rate, it was felt that inferences could not withstand any sampling error.

Revised Survey Instrument

Not only did the size of the original instrument discourage responses, but many of the item responses demonstrated a high consistency suggesting that a patterned response procedure was common. During the spring of 1983, the questionaire responses from the previous two years were analyzed in order to reduce the size of the instrument. The result was a reduction of over 50 percent. The item analysis, largely performed using SPSS, included several stages: pruning through use of inferential statistics, combination of multiple items into single questions based on correlations, consideration of student concerns by use of a pretest and a final decision process which included the subjective judgement of the researchers and an administrator at the university.

Chi-square goodness of fit tests and Student's t tests were applied to survey results to test the hypotheses that matriculants and non-matriculants had the same response pattern. If results for either test indicated differences with a significance level of .05 or stronger, the item was included for the next stage. Only 61 of the 108 items were reasonable to analyze (some of the responses referred to different institutions or were open-ended). In 1981, 31 of the 61 items were significantly different for non-matriculants versus matriculants. In 1982, there were 39 significant items. From the two years, 46 items were significant for one or both years.

Individual responses on the multi-item questions appeared to demonstrate a high degree of internal correlation. For example, teaching reputation of faculty, variety of courses, reputation of specific courses and general reputation of the university had very similar means, significance level on statistical tests and a correlation coefficient of .5 or greater. Based on this information, 15 items were aggregated into three: academics reputation, physical characteristics of the campus and extra-curricular activities.

The revised questionnaire was pretested on 60 university freshmen to check clarity of wording, possible negative reaction to certain questions and redundancy of items. The suggested revisions were discussed with university administration. Several deletion decisions were reversed because of need to know (influence of admissions publications) or because items had proved important in earlier research. The final questionaire consisted of 16 questions and 47 items fit easily on the front and back of one page. Again not all 47 items were suitable for predictive use; additional agendas are still included.

ANALYSIS OF SURVEY DATA

Test for Non-respondent Bias

Survey research assumes respondents are a random sample from the total population. To test this assumption, data for a random sample of 20 percent of the non-respondents were obtained from the admissions file. The sample was divided into the four groups of interest (by year and matriculation decision) then non-respondents were statistically compared to respondents. Specifically, Chi-square goodness of fit tests were performed on three variables:

-sex of applicant
-year of high school graduation
-academic college chosen by applicant.

The results strongly support the representativeness of the respondent sample. The Chi-square tests found no difference (significance = .01) in 11 of the 12 cases. The one exception was a higher than expected percent women responding in 1982. The lack of non-respondent bias supports using the sample results to make population predictions.

Deriving a Predictive Model Using Discriminant Analysis

While the dichotomous dependent variable,matriculation, was clearly defined, selection of independent variables were influenced by several considerations. Parsimony is a primary goal. However, the possibility of pruning important variables should be minimized. Stability over time is essential, without it, a selective admissions policy becomes very difficult to justify. Finally, the variables were fit to a student choice model which posits that the choice of attending is influenced by certain measureable characteristics.

The first consideration was met by defining two sets of variables, a parsimonious set and an inclusive set. The parsimonious set includes twenty-five items which corresponded to the questions on the revised questionaire. The inclusive set was formed of all variables which had different results on the inferential statistics tests and which contained good data. A total of 46 items comprised the inclusive set. The two sets of variables are summarized in Table I.

As mentioned earlier, the 1981 and 1982 surveys were administered at very different times during the year. The 1981 survey in February of the students freshman year; the 1982 survey during August before the first year of college.

Distributions and mean results for all 46 items from the inclusive set were compared. Non-matriculants in 1982 had different distributions or means in 20 of the 46 cases compared to 1981 results. Matriculants differed on 39 of the 46 variables. The tests confirm a difference in response for the two years, as one would expect given the timing difference. The consistency over time problem was handled by having the analysis include a split sample analysis for 1981 results only and a split sample for 1982 results only. In addition, 1981 results were used to predict 1982 decisions and visa versa.

The matriculation decision is a human choice process which we assume is influenced by the applicant, his or her environment and the institution. The proposed model consists of five composite variables:

I. attitudes toward the Cooperative Education program
II. Admissions Office activity
III. family and familiarity
IV. Northeastern's characteristics
V. scholastic ability of the applicant.

The items from the data analysis sets were assigned to the composite variables expressed by this conceptual framework. Each item was assigned to one of the variables; the assignment is shown in Table I.

Table I

Composite Model Definition

(Number of Items assigned to composite model variables)

Five Composite Variables	Parsimonious Set* (n=25)	Inclusive Set* (n=46)
I. Cooperative Education	2	4
II. Admissions Office	8	11
III. Family and Familarity	8	9
IV. Northeastern University	7	22
V. Scholastic Achievement	The SAT math and verbal scores were incomplete in 1981 and 1982, thus were not included in the analysis.	

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*Copies of the questionnaires (original and revised) and the list of items for each set are available on request form the authors.

Analysis of Results

The goal of the research is prediction of matriculation based on a small number of attitudinal and socio-economic variables. As mentioned earlier, two sets of variables were defined (parsimonious and inclusive) and we compared the relative strength of predictive ability for each set. The results support using the parsimonious set of variables. In 1981, seven of the top ten predictive variables selected by the stepwise discriminant analysis were identical for the parsimonious set versus the inclusive set (see Table II). In 1982, eight of the top ten were identical (Table III). The discriminant function based on one-half of the cases was used to classify the remaining cases. The accuracy of assignment is comparable for the full set of inclusive variables, the full set of parsimonious variables and the set of ten best parsimonious variables (Table IV). Thus, including extra variables has a negligible effect on predictive accuracy.

Table II

Top Ten Predictor Variables 1981

Order of Entry	Parsimonious Variables	Inclusive Variables
1	Importance of Cooperative Education	Importance of Cooperative Education
2	Cost after financial aid	Cost after financial aid
3	Social activities	Social activities
4	Location of NU	Location of NU
5	Apply financial aid	Apply financial aid
6	Distance from home	Open house at NU
7	Effect of meeting faculty	Distance from home
8	Difficulty of deciding between NU and others	Availability of Cooperative Education
9	Educational effect of Cooperative Education	Educational effect of Cooperative Education
10	Employment opportunities after graduation	Interview with NU staff

Table III

Top Ten Predictor Variables 1982

Order of Entry	Parsimonious Variables	Inclusive Variables
1	Importance of Cooperative Education	Importance of Cooperative Education
2	Difficulty of deciding between NU and others	Difficulty of deciding between NU and others
3	Campus visit	Campus visit
4	Apply for financial aid	Apply for financial aid
5	Cost after aid	Cost after aid
6	Effect of H.S. guidance counselor	Effect of H.S. guidance counselor
7	Social activities	Social activities
8	Effect of visit to NU	Variety of courses
9	Educational effect of Cooperative Education	Employment opportunities after graduation
10	Employment opportunities after graduation	Degrees beyond B.S.

Table IV

Relative Predictive Ability

	Percent Correctly Classified		
	Non-Matriculants	Matriculants	Total
1981			
Parsimonious set (n=25)	68.0 %	74.8 %	70.8 %
Inclusive set (n=46)	69.7	72.4	70.8
Top Ten Parsimonious	-	-	69.1
1982			
Parsimonious set (n=25)	63.8	73.8	71.0
Inclusive set (n=46)	62.4	75.2	71.7
Top Ten Parsimonious	-	-	69.5

There is less consistency when comparing 1981 results with 1982. However, in spite of the timing problems mentioned above, the sets of variables selected as the best ten predictors repeated 40 to 80 percent of the time. The repeatability improved to 60 to 100 percent for the best five predictors.

The analysis of results not only supports the rationale of a stratified admissions policy. The results also show that only a small set of additional information is needed to estimate the likelihood of matriculation. Thus implementation of a stratified admissions policy based on collecting a small set of additional information at time of application appears feasible.

FUTURE WORK

To verify the findings on predictive ability of question items, we plan to continue collecting survey data from all applicants. In order to obtain useful perceptions about Northeastern University it is imperative that the distribution of the questionnaire be appropriately timed. As was noted above, past timing had a discernable influence on student perceptions. Also, in a continuing effort to develop an intuitively appealing as well as statistically significant model, it is planned to perform forced factor analyses using the five composite variables previously defined as factors.

The ultimate goal of admissions efforts is to attract and enroll students who are especially well suited to the unique environment of Northeastern University, and who have a high probability of successfully completing their degree programs. To achieve this we require predictors of matriculation and of academic success in a chosen program of study. The next stages of this research to be undertaken will be the implementation and evaluation of a stratified recruiting program, and the collection of academic performance data for students during their freshman year.

Initially, successful completion of the freshman year will be used as a proxy for successful program completion. As these students are followed through their upper class years, performance data can be collected which will permit linking program completion to variables. Thus, recruiting may be focused upon, but not limited to, the set of students who are most likely to graduate. This will certainly be of educational benefit to both the student and the institution.

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A SURVEY OF THE CHARACTERISTICS & PLANS OF HIGH SCHOOL SENIORS IN NEW YORK STATE: SELECTED FINDINGS & MARKET RESEARCH POTENTIAL

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A survey of the characteristics and plans of high school seniors in New York State was conducted in May 1981. Responses were obtained from 10,878 seniors from 92 high schools representative of all the high school districts in the State. This paper summarizes some of the findings from the survey, as a means of illustrating the kind of information and insights that such a survey might offer a state or institution. The paper includes suggestions of ways in which the data might be of use to researchers and planners on individual campuses. Although the findings do not suggest any immediate policy actions, they do provide an expanded basis for understanding the plans of high school seniors and the factors that influence college enrollments. They help to define a context for estimating the possible impacts of future policy changes on college participation and enrollments.

Although the number of high school graduates in New York State has been declining since 1977 and the number is now beginning to decline sharply, recent high school graduates continue to be the largest pool of new full-time undergraduates in the State. For that reason, there is continuing interest in the plans of high school seniors among those responsible for enrollment planning at both the State and institutional levels. A wide range of student background characteristics were collected in this survey to allow detailed explanatory studies of student college choice. In addition, a large enough sample of students in a relatively confined geographical area was obtained to permit the study of quite specific categories of students and colleges.

A survey of the characteristics and plans of high school seniors provides information related to many different questions at many different levels of detail. At a global level of detail, general frequency results indicate overall conditions. For example, this survey indicated that the proportion of seniors interested in engineering that are women was 15.9% in 1981. Results of this type are referred to as Type I Probabilities: the probabilities that respondents have certain characteristics given specific respondent goals or behavior. These probabilities tend to be dependent on sampling errors and on current demographic and social conditions. Since population characteristics tend to change over time, these probabilities tend to change over time.

The stability and explanatory power of the results can be improved by accounting for the influence of the mix of demographic characteristics of the population. This is done by calculating the Type II Probability: the probability of a goal or behavior given one or more demographic characteristics. For example, the proportions of Hispanics and Asians interested in engineering, 5.8% and 20.8% respectively, are not biased by the race/ethnic mix. These Type II Probabilities permit attitudes of seniors to be monitored and projected, and specific assumptions to be made about future population mix to project a future supply of engineering students and their characteristics. Highly specific respondent types will generally provide the most stable and interpretable results; however, they may be laborious to produce and display. Care should be taken to avoid casual interpretations of results for general respondent types (i.e., simple cross-tabulations). Frequently, an additional uncontrolled variable is responsible for differences observed in the results.

A report of a general survey usually presents tables at various levels of detail to serve many purposes. The audience should be encouraged to focus on the Type II probabilities and on the detailed tabulations before assuming understanding of any underlying relationships. This is particularly helpful in avoiding the tendency to stereotype groups of students. Among the broad categories for which tables have been developed for this survey are the demographic mix of high school seniors, college participation and access factors, factors of college choice and out-of-state attendance, factors related to college program access and selection, and factors related to career goals. Since the nature of the results is descriptive and the volume of information is so large and diverse, the narrative will be minimal. The points made do not exhaust the information available in the survey data. They hopefully illustrate the value of such a survey to both states and individual colleges.

A FEW INTERESTING FINDINGS

General Characteristics

*40% of the seniors reported taking general or vocational tracks in high school.

*10% of the respondents felt that good luck was more important to success than hard work. Another 23% were uncertain.

*High school coursework was considered adequate or better by all but 14 percent of the respondents. Significant differences in the results occurred from district to district. Over one-third of the respondents were dissatisfied with the counseling, placement services, and specialized training services in their schools.

*53% of the respondents expect to be working in managerial or professional positions at age 35, compared with approximately 26 percent of the current work force in these professions.

College Plans

*In general, respondents from middle income families reported lower college plans than did other respondents. This may reflect student financial aid formulas.

*White seniors with low-A grades, from families with gross incomes between $12,000 and $15,000, reported much lower college plans than other respondents with low-A grades.

*White seniors with C grades, from families with gross incomes less than $6,000 reported notably higher college plans than other C grade students from families with incomes below $25,000. This may be an effect of the eligibility criteria for student aid and opportunity programs.

*College plans vary substantially and in complex ways for specific types of students as defined by level of family income, siblings, race, gender, and mother's education. Almost all Asians were college bound, but for other race/ethnic groups, complex socio-economic interactions appeared to be functioning. Although there were some exceptions, Whites, Blacks and Hispanics of specific types reported quite similar college plans. Most of the interaction effects occurred for mid-range ability students. High ability students were generally less affected by other variables, than were low and middle ability students.

*Given the complex nature of college participation plans of different types of students observed from the survey, uniform changes in student aid policies by income would not result in equal changes in participation for students from given income levels. A particular level of resources may support equal access but to achieve equal participation would require influencing attitudes and beliefs as well as resources.

*A preliminary review of college plans by type of student and expected demographic population trends suggest that aggregate participation rates by 1990 may decline somewhat in New York State, and that the proportion of students entering colleges with high ability may increase somewhat.

*As shown in Table 2 high ability students expect to attend almost all types of colleges, not just those typically thought of as attracting the most able students. The attendance plans of seniors with lower ability and of every income group are also widespread. Middle income seniors report what appear to be suppressed attendance plans for centers, multiversities, college complexes, and colleges.

*The higher the educational attainment of a senior's parents, the higher the likelihood of plans to attend a four-year rather than a two-year college.

*Seniors expecting to attend a SUNY center, university, or community college were more likely to feel their choice of college was severely restricted than was any other group (20%, 17%, and 15%, respectively).

*Program emphasis across types of colleges varies greatly as would be expected. These differences naturally orient students with different interests in different directions. For example, the higher interest of Blacks and Hispanics in education would tend to elevate minority enrollment shares for the SUNY universities and Independent colleges.

Program Interests

*Program interests of respondents from various regions of the State vary noticeably. Differences appear to be due to both the program offerings available in those regions and the socio-economic mix of the respondents from those regions.

*High ability students of specific types (given the variables used in this analysis) appear not to limit their interest to one or a very few programs, but instead spread their interests considerably. Less than 20 percent [illegible] any student type tended to be interested in any given program.

*Females with high verbal ability in particular, and high ability respondents in general tended to be interested in the more applied, career-oriented programs. This effect is stronger for lower income families and students with 2 or more siblings within three years of age.

Gender

*12% of both male and female respondents felt that limited fiscal resources severely restricted their choice of college.

*Females tended to be relatively more concerned with high academic reputation and special curricula of colleges, while males were relatively more concerned with coed, sports, and special interest opportunity aspects of colleges.

Race/Ethnicity

*57% of the Asians reported A grades as did 23% of the Whites, 8% of the Blacks, and 12% of the Hispanics. Except for Asians, these differences are reduced by controlling for other student characteristics such as parent education.

Out-of-State Choice of College

*According to these results for New York State, variables which help to predict college attendance are also helpful in predicting an out-of-state college choice. For example, high ability students are more apt to be college oriented and the highest ability students are most apt to plan to attend college out-of-state.

*The strongest predictors of out-of-state college plans were high grades, high ability, high family income, high parental education, interest in public affairs, social science and military science programs, and multiple applications to colleges. They tend to be students less apt to be influenced by student aid or scholarship policies. These students tended to be interested in a wide range of types of colleges. However, the most predictive reasons given for planning to attend an out-of-state college were better academic reputation, special curriculum, better financial aid, and military requirements.

Interest in Engineering

*Sixteen percent of seniors interested in engineering were women. Of all women planning college 2 percent marked engineering compared to 15 percent of the men planning college.

*In addition to the City University colleges, Blacks & Hispanics appear to be relatively well represented in the Independent specialized colleges (13 & 20%, respectively).

These findings and the more detailed tables described in the full report provide a great many insights about: the kinds of young people leaving the high schools, the plans of high school seniors, and the intricacies of student choice in general. Consideration is being given to replicating the survey in the near future. New York State is undergoing considerable changes in its economy and the demographic characteristics of its population. Regular monitoring of these changes and their effects on prospective students would prove helpful to many planners.

MARKET ANALYSIS

An important advantage of a large Statewide survey of prospective students is that a more complete picture may be obtained than would be possible from examining students who applied to or entered a single college. The sizes and locations of relevant pools may be tapped as may those pools with marginal interest (did not actually apply). Adequate sample sizes will also be present in the data for quite detailed types of prospective students.

An institutional researcher might begin to tap these data through studies at two different levels of detail. This first, more general study would key analyses to ones own type of institution. The results would tend to be general and of interest to many people. A first step might be to examine the characteristics of respondents linking (via interest application, or attendance) groups of institutions that are of interest and who may compete with each other for students. Table 1 provides this sort of information, from the survey, for one categorization of colleges. The table shows some distinct differences among the colleges that suggest patterns of movement given changes in student demographics or policy initiatives (e.g., tuition charges). More sophisticated multivariate studies would help to refine and test hypotheses about enrollment patterns and shifts.

Table 3 provides a more refined descriptive cut on the data for types of institutions. This table suggests that in New York State, access (even for high ability students) may differ somewhat by type of institution and level of family income. We normally assume that the highest income groups have the greatest freedom of choice. Consequently, it is interesting that the highest income groups show particularly low college plans to attend independent universities and engineering colleges. This suggests an attractiveness or competitive edge for similar institutions out-of-state and possibly for other institutions in-state. It is also notable that the SUNY Community Colleges and the CUNY institutions are more attractive for the lowest income levels even for high ability students. Competitive influences that explain these differences provide a take-off point for policy initiatives. More detailed analyses can be done to help explain the differences.

The second type of study would be keyed specifically to a single institution and its particular competitors. Most institutions can list their primary clients and competitors, but more objective approaches (clustering, multidimensional scaling, etc.) can help to refine the list and may produce some surprises.

TABLE 1

NEW YORK STATE
CHARACTERISTICS OF HIGH SCHOOL SENIORS
BY
INSTITUTIONAL CATEGORY OF EXPECTED ATTENDANCE

Nonpublic Institutions

Student Descriptor	Multiversities	Universities	College Complex	Colleges	Spec. College	Engin. or Tech.	2-Year	Proprietary
N:	372	338	523	257	15	174	78	157
Females:	52%	65%	66%	81%	64%	29%	46%	85%
Few (0-1) Siblings: Within Three Years of Age:	76	76	68	65	73	74	65	67
Academic Program:	90	85	82	84	86	84	53	51
7-8 Semesters Math:	72	54	60	47	21	71	21	15
" " English:	91	92	89	92	93	88	82	83
" " History:	55	54	50	46	71	46	37	40
Foreign Language:	27	29	26	25	14	18	4	8
Black:	6	6	7	6	13	8	8	10
Hispanic:	4	4	3	4	20	4	4	2
Asian:	17	2	4	-	-	9	-	1
White:	73	86	86	89	60	78	87	86
A Grades:	58	34	38	31	21	46	13	17
90th %tile Verbal Skills:	35	17	23	12	27	28	9	15
90th %tile Math Skills:	45	22	24	14	20	47	5	9
VERY IMPORTANT VALUES								
Excell in Work:	70	65	68	62	73	66	60	67
Marriage:	53	58	55	49	53	48	42	60
Children:	25	30	28	29	7	19	13	31
Friends:	73	65	66	64	47	61	53	53
Oppor. For Children:	44	53	47	45	33	48	47	57
Correcting Inequalities:	17	16	14	18	20	14	13	12
Wealth:	23	26	23	17	47	26	29	27
Secure Life:	66	74	70	69	67	69	75	73
Being a Leader:	12	13	8	10	13	9	13	7
Social Status:	11	16	11	7	13	11	14	10
Leisure Time:	52	48	40	37	53	51	34	36
GROSS PARENTAL INCOME								
Less Than 12,000:	12	15	15	20	29	10	24	20
12,000-20,000:	17	19	15	17	43	28	20	36
Greater than 20,000:	71	67	70	64	29	74	56	44
Perceived Handicap:	15	16	16	17	10	13	23	24
Father with 1 or More Years of College:	66	42	53	48	43	52	41	24
Mother with 1 or More Years of College:	54	33	44	40	43	42	40	26
Internal Locus of Control:	63	67	72	80	57	67	65	72
I am a Person of Worth:	94	93	92	94	93	91	97	92
Able to Do Things Better than Most Others:	51	46	40	35	39	54	40	41
Often try new things:	83	89	88	90	93	83	90	90
School often interesting:	77	74	74	73	67	76	68	64
Doctorate is Very Impor.:	29	24	19	17	7	20	16	15
HIGH SCHOOL NEEDS IMPROVEMENT								
Coursework:	11	11	9	14	7	10	13	9
Counseling:	37	39	37	35	40	40	34	31
Placement Service:	34	35	39	33	27	43	40	38
Specialized Training:	35	36	45	43	40	42	33	29
Extracurricular Activit:	16	16	13	17	7	22	21	19
TEACHER ENCOURAGEMENT								
A great deal on Military :	1	-	1	1	-	-	1	1
" " College :	73	70	72	74	60	66	59	59
Other training :	6	6	5	9	7	1	8	14
Job :	7	9	7	7	14	6	9	15
Homemaker :	1	2	1	0.4	7	-	-	1

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TABLE 1 (continued)

	Multiversities	Universities	College Complex	Colleges	Spec. College	Engin. or Tech.	2-Year	Proprietary
COLLEGE PLANS								
This Fall, full-time :	97	97	95	95	93	94	83	90
This Fall, part-time :	1	2	3	2	7	2	3	8
Attend Within 3 Years :	2	1	2	2	-	2	14	2
Never Attend :	0.3	0.3	0.6	0.8	-	1.2	-	-
REASON OF GREAT IMPORTANCE FOR ATTENDING COLLEGE								
Professional Excellence:	58	52	45	39	64	53	53	49
Job Access:	54	48	45	39	50	57	48	40
Self-Understanding:	36	32	26	26	21	23	26	32
College Life :	18	17	13	7	7	13	11	8
Sake of Learning:	38	30	30	30	14	29	38	29
To do Something Diff. :	8	5	5	4	7	5	10	9
PROGRAM OF INTEREST								
Business:	13	28	26	21	7	11	19	31
Computer and Information Systems :	8	10	8	7	0	13	3	7
Education:	1	4	4	10	0	0	3	-
Engineering:	15	2	5	0	0	33	7	1
Law:	9	13	9	4	0	2	1	1
Technologies:	4	2	6	9	0	7	22	42
Choice of College Severely Restricted:	9	10	7	10	8	6	7	9
NECESSARY COLLEGE CHARACTERISTICS								
Coeducational:	44	36	33	25	50	31	19	13
High Academic Reputation:	59	54	51	47	58	58	33	36
Where Friends Go :	2	2	1	0.4	8	3	-	-
Strong Sports Program:	6	5	6	6	-	7	9	3
Small Intimate Atmosphere :	2	5	11	13	-	8	11	7
Special Interest Opportun.:	13	12	9	9	17	10	10	9
Students Resemble Me:	6	4	4	5	-	2	-	6
Strong Research:	19	15	11	10	-	21	3	17
Physically Attractive :	11	10	9	4	9	7	11	6
Special Curriculum:	56	57	51	59	67	58	48	48
Strong Cultural Opportunity:	19	13	13	13	50	11	12	10
Less than 1 Hr. from Home:	5	21	11	13	17	9	10	15
More than 8 Hrs. from Home:	2	3	2	0.4	-	1	4	4
Urban:	7	8	5	6	25	6	4	8
Suburban:	3	6	5	4	8	2	7	1
Rural:	1	3	3	2	-	4	6	3
Religious Affiliation :	3	3	3	10	-	2	1	3
Parents Prefer It:	7	8	5	7	-	7	8	6
Strong Social Life:	21	22	18	18	25	16	11	12
EXPECTED WORK AT AGE 35								
Clerical or Sales:	0.6	1.3	2.6	3.4	7.7	2.4	4.3	40.3
Craftsworker:	0.3	0.6	0.4	-	-	1.2	7.2	-
Farmer:	0.3	0.6	1.2	0.4	-		1.4	-
Technical :	8.6	9.1	9.0	9.2	15.4	25.0	14.5	5.6
Housewife :	1.2	5.8	5.3	7.1	-	1.2	1.4	4.9
Laborer/Operative/Service :	0.6	-	1.2	0.8	-	-	4.3	2.1
Military/Protective:	0.6	1.6	0.2	0.8	-	2.4	-	-
Proprietor:	1.8	4.2	2.4	1.7	-	1.8	17.4	2.8
Manager/Administrator :	12.7	13.6	17.1	13.4	-	6.5	10.1	20.1
Professional (e.g., Physician, scientist):	41.6	33.7	27.1	16.8	-	14.9	5.8	4.9
Professional (e.g., Nurse, school teacher accountant, Engineer, artist:	31.3	29.1	32.6	45.0	-	46.6	33.3	18.8
Not Working:	0.6	0.3	0.8	1.3	76.9	-	-	0.7

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TABLE 1 (continued)

Student Descriptor	State University					City University	
	Centers	Univ.	Spec & Statutory	ATC	CC	Senior	CC
N:	387	512	38	436	1193	507	260
Females:	56%	64%	49%	53%	57%	64%	75%
Few (0-1) Siblings Within Three Years of Age:	72	66	76	66	55	70	73
Academic Program:	89	83	95	61	55	78	71
7-8 Semesters Math:	67	57	84	33	28	45	25
" " English:	91	89	92	87	84	91	90
" " History:	57	37	45	31	34	41	27
Foreign Language:	25	18	34	7	7	18	13
Black:	8	6	5	3	4	20	20
Hispanic:	8	1	3	1	1	14	19
Asian:	2	0.4	3	0.5	0.3	5	1
White:	82	92	89	95	93	61	59
A Grades:	46	24	62	12	11	20	8
90th %tile Verbal Skills:	18	12	42	6	7	12	16
90th %tile Math Skills:	34	16	45	7	10	17	5
VERY IMPORTANT VALUES							
Excell in Work:	68	61	68	60	61	64	58
Marriage:	58	49	53	54	52	53	49
Children:	30	23	16	22	25	26	29
Friends:	65	64	63	55	58	52	41
Oppor. For Children:	44	42	28	48	53	59	67
Correcting Inequalities:	14	13	13	9	11	22	19
Wealth:	25	21	18	26	27	28	27
Secure Life:	69	66	63	67	72	76	70
Being a Leader:	9	9	11	7	8	8	6
Social Status:	10	11	5	9	11	14	10
Leisure Time:	44	43	34	34	42	45	35
GROSS PARENTAL INCOME							
Less Than 12,000:	11	12	3	22	19	26	32
12,000-20,000:	16	19	10	21	20	24	27
Greater than 20,000:	73	69	87	57	61	51	41
Perceived Handicap:	15	19	9	16	19	22	21
Father With 1 or More Years of College:	58	56	68	35	37	30	22
Mother With 1 or More Years of College:	39	54	57	31	27	24	13
Internal Locus of Control:	70	70	71	72	67	65	65
I Am a Person of Worth:	94	93	92	87	91	90	91
Able to Do Things Better than Most Others:	48	37	53	28	34	46	36
Often try new things:	74	86	87	87	86	85	89
School often interesting:	70	70	74	64	63	74	69
Doctorate is Very Impor.:	26	17	40	9	11	26	20
HIGH SCHOOL NEEDS IMPROVEMENT							
Coursework:	10	11	13	13	13	14	14
Counseling:	44	41	40	40	37	40	30
Placement Service:	43	41	45	41	37	35	37
Specialized Training:	45	42	54	37	33	38	40
Extracurricular Activit.:	17	15	24	20	20	25	25
TEACHER ENCOURAGEMENT :							
A great deal on Military:	1	1	0	1	1	1	-
" " " " College:	72	63	68	55	58	67	58
Other training:	5	5	0	6	9	10	9
Job:	6	5	3	10	15	14	17
Homemaker:	1	0	0	1	1	3	2

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Student Descriptor	Centers	Univ.	Spec. & Statutory	ATC	CC	Senior	CC
COLLEGE PLANS							
This Fall, full-time:	96	98	100	94	86	91	85
This Fall, part-time:	2	1	0	3	9	6	11
Attend Within 3 Years:	1	1	0	4	4	2	4
Never Attend:	0	0	0	0	1	1	0.8
REASON OF GREAT IMPORTANCE FOR ATTENDING COLLEGE							
Professional Excellence:	51	38	58	38	40	47	42
Job Access:	50	43	55	48	44	46	40
Self-Understanding:	27	24	16	20	22	31	22
College Life:	15	12	13	9	8	12	7
Sake of Learning:	29	24	40	22	25	26	23
To do Something Diff.:	8	6	5	5	6	7	5
PROGRAM OF INTEREST							
Business:	18	17	8	21	25	19	21
Computer and Information Systems:	9	10	0	7	8	13	11
Education:	2	17	3	2	3	5	5
Engineering:	11	5	16	7	7	5	3
Law:	8	3	3	2	3	5	4
Technologies:	4	5	3	29	21	11	26
Choice of College Severely Restricted:	20	17	11	11	15	11	12
NECESSARY COLLEGE CHARACTERISTICS							
Coeducational:	45	40	42	25	26	29	21
High Academic Reputation:	49	35	51	28	25	39	30
Where Friends Go:	2	1	0	2	3	4	3
Strong Sports Program:	5	7	3	5	8	7	8
Small Intimate Atmosphere:	2	6	0	3	4	3	6
Spec. Interest Opportunity:	10	12	5	9	10	11	12
Students Resemble Me:	6	5	6	4	3	4	2
Strong Research:	17	9	19	7	9	16	12
Physically Attractive:	8	10	3	7	9	6	8
Special Curriculum:	51	54	65	44	41	51	47
Strong Cultural Opportunity:	14	10	11	7	8	11	10
Less than 1 Hr. from Home:	5	5	0	9	21	16	22
More than 8 Hrs. from Home:	3	4	0	2	4	2	3
Urban:	4	2	0	2	4	12	10
Suburban:	5	4	3	4	6	5	3
Rural:	3	5	3	5	3	2	2
Religious Affiliation:	4	3	8	3	2	3	0.9
Parents Prefer It:	6	3	3	5	5	6	7
Strong Social Life:	21	18	19	16	15	17	23
EXPECTED WORK AT AGE 35							
Clerical or Sales:	.3	1.5	0	12.2	10.2	3.3	19.8
Crafts worker:	.6	.4	0	5.1	2.2	.9	1.8
Farmer:	.6	.2	2.7	7.1	0.6	.9	0
Technical:	10.1	13.8	10.8	21.4	17.6	17.1	10.6
Housewife:	4.2	6.2	0	5.4	5.9	6.2	9.3
Laborer/Operative/Service:	1.1	.6	0	3.4	2.8	1.3	3.1
Military/Protective:	.8	1.7	2.7	1.7	3.0	1.6	.9
Proprietor:	2.8	2.6	5.4	5.1	4.4	3.8	4.0
Manager/Administrator:	13.4	8.7	5.4	10.7	13.4	8.9	11.5
Professional (e.g., Physician, scientist):	36.0	18.5	54.1	7.3	8.6	21.8	10.6
Professional (e.g., nurse, school teacher, accountant, Engineer, artist:	28.8	45.1	18.9	19.7	30.7	33.4	28.2
Not Working:	1.4	.6	0	1.0	0.6	.7	.4

SOURCE: NYSED, Office of Postsecondary Research, 1981 Survey of High School Seniors (GLR5/83).

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TABLE 2

COLLEGE ATTENDANCE PLANS OF NEW YORK STATE HIGH SCHOOL SENIORS BY ACADEMIC ACHIEVEMENT & BY FAMILY INCOME

	Academic Achievement				Family Income		
	Above 90th % Tile		Below 60th % Tile				
	Verbal	Math	Verbal	Math	Less Than $12,000	$12-20,000	More Than $20,000
SUNY							
Center	9.0%	13.4	5.2	3.4	4.6	5.8	8.6
University	7.8	8.3	10.7	8.8	6.5	9.1	10.8
Spec. & Statutory	2.1	1.7	0.1	0.1	0.1	0.4	1.0
Ag. & Tech.	3.3	3.1	11.1	10.9	10.2	8.7	7.6
Comm. College	10.8	12.1	28.3	30.2	24.1	22.5	22.2
CUNY							
Senior	7.8	8.7	8.2	10.3	13.9	11.5	7.9
Comm. College	5.4	1.3	4.9	6.7	8.8	6.6	3.3
Independent							
Multiversity	16.7	16.9	3.6	2.6	4.8	5.9	8.1
University	7.3	7.5	5.6	5.9	5.4	6.0	6.9
College Complex	15.4	12.7	9.6	8.3	8.5	7.3	11.1
Colleges	4.0	3.6	5.3	5.0	5.4	4.1	5.0
Specialized	0.5	0.3	0.2	0.4	0.4	0.6	0.1
Engr. & Tech.	6.3	8.4	2.0	1.6	1.9	4.6	4.0
2-Year	0.9	0.4	1.8	1.8	2.0	1.5	1.3
Proprietary	2.9	1.4	3.3	4.1	3.3	5.4	2.1
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

SOURCE: NYSED, Bureau of Postsecondary Research, 1981 Survey of High School Seniors (GLR10/83).

TABLE 3

NEW YORK STATE
COLLEGE CHOICES OF COLLEGE BOUND
HIGH ABILITY HIGH SCHOOL SENIORS*
BY
FAMILY INCOME
1981

Type of College	Less than $9,000	$9-15,000	$15-20,000	$20-25,000	$25-35,000	$35,000+
New York State						
State University						
Center	0.0%	6.3	5.9	8.6	6.0	5.1
University College	6.5	2.1	5.9	3.7	10.3	1.8
Spec. & Statutory	0.0	0.0	3.9	2.5	0.9	2.2
Ag. & Tech.	3.2	4.2	2.0	0.0	0.0	0.4
Comm. College	12.9	4.2	2.0	2.5	3.4	2.9
CUNY						
Senior	16.1	8.3	7.8	7.4	6.0	1.4
Comm. College	3.2	0.0	2.0	0.0	0.9	0.0
Independent						
Multiversity	9.7	6.3	15.7	13.6	15.5	14.9
University	9.7	2.1	9.8	8.6	3.4	4.0
College Complex	3.2	4.2	9.8	14.8	8.6	7.6
College	0.0	0.0	0.0	2.5	2.6	1.8
Engr. & Tech.	0.0	14.6	9.8	6.2	7.8	2.9
Two-Year	0.0	2.1	0.0	1.2	0.0	0.4
Proprietary	0.0	4.2	0.0	2.5	0.9	0.4
Instate, Other	0.0	0.0	0.0	1.2	0.9	0.4
Out-of-State	35.5	41.7	25.5	24.7	32.8	54.0
	100%	100%	100%	100%	100%	100%

*High Ability: Above 90th Percentile on Verbal and on Math Skills.

SOURCE: NYSED, 1981 Survey of High School Seniors (GLR10/83).

The survey data is particularly useful in that it is able to identify prospective students with some interest in a given college but who might not make formal contact with the college.

These are potential clientele that might be attracted given some strategic change in recruitment or college characteristic. Focus on those students who were interested but chose to go elsewhere will clarify areas in which competitors have an advantage. Given the kind of data available in the survey, analysis of advantages must rely on arraying preferred student characteristics against the actual characteristics of the colleges considered by the student.

It should also be of interest to examine the satisfaction of respondents with the college they are attending or expect to attend. If a large portion of a college's students feel they are at their 2nd or 3rd choice college, then changes implemented at their preferred institutions could produce large sudden enrollment declines. Demographic pool decline might catalyze the decline, for example, by making more seats available at the preferred institutions. Such a situation might direct policy makers to attempt to shift their market position. A college might need to perform these kinds of analyses for several subpopulations of its students.

SUMMARY

A Statewide survey of high school seniors provides a great variety of information relevant to many different groups. Some results of the New York State 1981 survey of high school seniors have been presented. More complete and detailed analyses are available in the full report upon request. This data set is available to other researchers on tape, as is an SPSS program and selected fortran programs prepared for the data. Institutional researchers feeling that the data might be helpful to them should contact the author to obtain the data and to discuss efficient ways to generate data specific to their needs.

Monitoring Students

A COMPREHENSIVE APPROACH
TO OUTCOMES STUDIES

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INTRODUCTION

By its very nature, a college claims to be an institution based on the premise that knowledge is preferred to ignorance, and rational thought to irrational behavior. As in any organization, it is imperative that a college set reasonable goals and strive to attain them. An implication of these claims is that there is value in using knowledge to make rational decisions about the pursuit of goals.

OUTCOMES PROJECT

The King's College is a four-year, Christian liberal arts college. Located in suburban Westchester county, New York, it is small (770 students), coeducational (2:1 female to male ratio), residential (90% in dormitories), and nondenominational (over 40 denominations or groups represented among the students). During the mid-sixties, in a drive for regional accreditation, the faculty developed a statement of a philosophy of education which was adopted formally by the College in 1967. A detailed statement of goals for the student was derived from the philosophy and adopted in 1968. Apart from individual faculty and departmental attempts at measuring the attainment of these goals by students, there had been only one College-wide evaluation of the attainment of student goals (1971-72).

In the late seventies-early eighties, several factors came together which led to a renewed interest in student learning outcomes. The faculty and the administration of the College recognized four reasons why an outcomes project would be necessary and worthwhile.

(1) Existing and future course and non-course learning experiences are formed on the basis of feedback concerning the student attainment of goals.

(2) Institutional integrity demands an assurance that certain things are occurring in student learning and personal growth. The College implicitly and explicitly claims that its graduates will exhibit

certain qualities and competencies.

(3) Periodically, the College must be accountable to external agencies for the success in carrying out its mission. Student outcomes information is an integral part of how the College can establish its claim to success.

(4) As an institution, the College must model the kind of approach to growth and development that it desires for individual students. The College must show through institutional action that efforts are extended to make honest evaluations of the College. The institution must model a decision-making process which is based on knowledge of how the institution is doing.

An ad hoc group of three administrators and four faculty members began meeting to discuss the possibility of an outcomes project. With some assistance provided by the Council for Independent Colleges ar two of its annual meetings, this group formulated a plan of attack. The first step in the attack was to obtain faculty approval of the institution of a regular faculty committee on outcomes. The second step was to formalize the concerns which had been discussed for the previous two years.

In those discussions, it was discovered that the twelve goals for the student in the College Catalog could be broken down into approximately ninety goal statements. The Outcomes Committee reformulated the twelve goals into what it believed were seventeen major areas in which student outcomes could be measured. These areas were:

- linguistic competency
- liberal arts knowledge
- integration of knowledge
- aesthetic understanding and appreciation
- physical well-being
- maturing faith in Jesus Christ
- major competency
- biblical knowledge
- cultural understanding and appreciation
- critical and creative thinking
- active expression of Christian faith
- developing personal values
- concern for societal responsibilities
- educational satisfaction
- developing self-understanding and self-actualization

- entering into a life-long process of pursuing truth
- career development

The next phase involved a rank ordering of the areas to provide priorities for action. The Committee decided to concentrate its attention on six areas, but eventually to work on all other areas as well. The six were:

- liberal arts knowledge
- linguistic competency
- biblical knowledge
- critical and creative thinking
- major competency
- integration of knowledge

The Committee has spent time clarifying the meaning of these areas and has investigated possible measuring instruments for these areas. As the Committee considered linguistic competency, for example, it divided it into several components. Within the realm of linguistic competency, there are the areas of reading, writing, speaking, and listening. Within each area, there are also several skill areas, such as vocabulary, speed, and comprehension under reading. In addition to the traditional areas mentioned above, the Committee also considered the new linguistic competency of computer literacy. When the Committee began to investigate possible measuring instruments, it could not find one instrument suitable for all the components of linguistic competency. The Committee decided that, in this area and possibly in others, more than one instrument might be necessary.

For each area, the Committee has constructed or plans to construct a concise listing of objectives, indicators, and existing measures. Charts 1 and 2 present the work done so far for critical and creative thinking.

The Committee began to develop a long-range plan for the evaluation of student learning outcomes and set up a timetable for the implementation of the early stages of this plan. The initial data gathering effort began in January, 1983, with a Senior Test Day. The initial testing included the use of the objective test of the College Outcome Measures Project of The American College Testing Program (COMP-ACT), the Watson-Glaser Critical Thinking Appraisal, and Higher Education Measurement and Evaluation Kit (KIT) by C. Robert Pace and Associates. Some of the reasons for selecting these instruments are outlined in Chart 3.

Goal Area: Creative Thinking

CHART 1

Objective	Indicators	Existing Measures
1. Ideational fluency	The student will be able to generate a significant quantity of ideas, words, titles, responses, phrases, sentences, uses, consequences, productions (drawings, pictures, designs, other sense stimuli).	Torrance Test of Creative Thinking
2. Associational fluency	The student will be able to complete relationships, produce relations, generate synonyms, analogies, similarities, problems of likeness.	TTCT
3. Expressional fluency	The student will be able to fit ideas into systems or structures, organize them into systems or logical theories; state sentences, verbal ideas and question responses.	TTCT
4. Spontaneous flexibility	The student will be able to express a variety of kinds of responses in classes; consider a number of properties, attributes or inherent characteristics of a problem or product; make shifts in category responses; demonstrate versatility.	TTCT
5. Adaptive flexibility	The student will be able to make a number of detours, demonstrate freedom to make changes, employ a number of approaches or strategies in seeking solutions; make a number of changes of interpretation, and changes in direction of thinking.	TTCT
6. Originality	The student will be able to make verbal, figural, and symbolic transformations that are of uncommon objective unusualness, statistically infrequent, and subjective choices that are clever, far-fetched, novel, or different from the standard or norm.	TTCT and Thinking Creatively with Sounds and Words, Research Ed.
7. Elaboration	The student will be able to produce detailed steps, varieties of implications and consequences.	TTCT and Thinking Creatively with Sounds and Words, Research Ed.

Goal Area: Critical Thinking*

CHART 2

Objective	Indicators	Existing Measures
1. Inference	The student will be able to discriminate among degrees of truth or falsity of inferences drawn from given data.	Watson-Glaser Critical Thinking Appraisal
2. Recognition of Assumptions	The student will be able to recognize unstated assumptions or presuppositions in given statements or assertions.	Watson-Glaser
3. Deduction	The student will be able to determine whether certain conclusions necessarily follow from information in given statements or premises.	Watson-Glaser
4. Interpretation	The student will be able to weigh evidence and decide if generalizations or conclusions based on the given data are warranted.	Watson-Glaser
5. Evaluation of arguments	The student will be able to distinguish between arguments that are strong and relevant and those that are weak or irrelevant to a particular question at issue.	Watson-Glaser
6. Definition	The student will be able to recognize that crucial words and phrases must be precisely defined and that a changed definition may produce a changed conclusion although the argument from each definition is logical.	Logical Reasoning Test (ETS) (out of print)
7. Indirect Argument	The student will be able to determine that the validity of an indirect argument depends upon whether all the possibilities have been considered.	Logical Reasoning Test

*"...The correct assessing of statements" - Bruce L. Stewart

Goal Area: Critical Thinking (Cont'd)

Objective	Indicators	Existing Measures
8. Argumentum ad hominem	The student will be able to understand that an attack on certain aspects of a person or institution, even though justified, is not sufficient to prove the lack of all merit in that person or institution.	Logical Reasoning Test
9. If – then	The student will recognize that if one accepts certain premises, then one must accept the conclusion which follows from these premises.	Logical Reasoning Test
10. Discriminative thinking (value referenced)	The student will avoid the errors of: —interpreting through personal judgment which is external to the data —evading the issue by name-calling or ridicule —leaning on authority —believing in superstitution —generalizing from insufficient evidence —rationalizing or misinterpreting data —calling either-or statements "true" —calling if-then statements "true" —leaning on school loyalty	Ohio Thinking Checkup (out of print)

January 1983 Senior Testing Day

CHART 3

Instrument	Group	Comments
COMP-ACT (2 hr. objective test)	All Seniors	1. Provide experimental alternative to ETS Area Test (due to be phased out 1983) 2. Covers liberal arts/general education—will meet the general directive of the faculty in terms of graduation requirement 3. Goal areas: - linguistic competency - liberal arts knowledge - integration of knowledge
KIT Scales (Selected) - Educational Priorities - Family Educational Background - Geographic Background	All Seniors	1. Provide baseline data for profile of our students 2. Aid in gathering data useful for Middle States visit 3. Goal area: None
KIT Scales	Group A (½ of seniors)	1. Ease of administration (short) 2. Low cost 3. Cover a number of areas (although not in depth) 4. Goal areas: - cultural understanding and appreciation - aesthetic understanding and appreciation - concern for societal responsibilities - developing a life long process of pursuing truth - developing personal values
Watson-Glaser Critical Thinking Appraisal	Group B (½ of seniors)	1. Provide data on one of the goal areas of high concern 2. Have good reason to believe this is an adequate and valid test for this area 3. Goal area: - critical and creative thinking

The arrangements for the Senior Testing Day in January, 1983, included morning and afternoon sessions. The morning session lasted a little over two hours. All seniors were given the COMP-ACT and the three profile scales from KIT. For the afternoon session, the seniors were divided approximately in half. The division took into account such variables as sex, major, and whether or not the student was a transfer student. The afternoon session lasted less than 90 minutes.

The results of the COMP-ACT test showed that the College's seniors compared favorably with the national sample overall (50.6 percentile). Above average scores were attained in the scales of Using the Arts, Communicating, Clarifying Values, and Using Science, while there were below average scores in Problem Solving and Functioning in Social Institutions. The students who took the Watson-Glaser Appraisal had a group mean score of 62.2, which is higher than all of the post-secondary norm samples, except third-year medical students. Although comparative data were available for only some of the KIT scales, the comparisons which could be made tended to show above average results. The highest scores were found generally in campus morale, campus environment, and faculty characteristics. An area of below average score was social awareness, which reinforced the results of Functioning in Social Institutions scale on the COMP-ACT.

Several of these results were surprising to the Committee and to the faculty as a whole. On the positive side, the faculty had expressed concern over the aesthetic understanding and appreciation of the College's students. The COMP-ACT and KIT results seemed to indicate that the students are developing more in this area than the faculty thought they were. On the negative side, whereas the faculty thought that social awareness, concern, and ability to function were strengths, the test results did not indicate that. Although more testing must be done to verify these observations, the preliminary results have started the faculty thinking about their assumptions and what they are doing in and outside of the curriculum to foster social maturity.

As part of the long-range plan, the Committee is planning to have another Senior Testing Day in January, 1984. In addition to repeating COMP-ACT and KIT, the Committee plans to administer a test which addresses the area of biblical knowledge. The Committee is investigating several alternatives and a final selection has not yet been determined. The Committee hopes to set up a three- to five-year cycle in which all of the 17 areas of concern will be covered.

As the Committee considers each of the 17 areas, it is attempting to clarify and define the competencies, skills, or components of the area. The Committee plans to publish this work, both for internal and external use. As the project proceeds through the planned cycles, revisions and modifications will be made.

SUMMARY

The King's College has begun a comprehensive student learning outcomes project. It is comprehensive in its scope, dealing with the institutional goals for the student. The strength of the program comes from the faculty commitment and involvement in the project. The purpose of the project is to help the College better serve its students, and the preliminary results are encouraging.

STRATEGIES FOR ASSISTING ACADEMIC DEPARTMENTS IN STUDENT OUTCOMES ASSESSMENT

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INTRODUCTION

As institutional researchers and planners in postsecondary education, we generally are aware of the growing interest on the part of academic departments for better information about student outcomes. We are aware that academic program heads and faculty are not only interested in who their new and current students are, but the impact of the program curricula on student development and retention and the successes of program graduates. We also are aware that persons most concerned with the financial health of the institution -- president, treasurers, trustees -- need to know not only enrollment trends and the backgrounds and needs of new and continuing students, but the impacts program within the college are having on students. They also need to have information about the percentage of students who leave school prior to completing their degree program and why. We recognize that students themselves want to know more about what it means for a student to enroll in the institution or one of its programs and what are the employment and postgraduate experiences and successes of recent graduates.

In addition to these internal demands for better information about student outcomes, institutional researchers and planners are equally aware of the external demands for such information. For example, institutions participating in federal student-aid programs are required to provide information about retention and program completion to prospective students. Central governing boards and state planning groups frequently request information about program utilization, degrees granted, and the success of students. Finally, the interest of regional and professional accrediting bodies has increased with regards to information about student outcomes. They are interested in knowing more about how well student goals are being met, what differences the college experience is making for those students, and how the institution and its programs are using this information to enhance planning decisions.

How to satisfy the internal and external demands for better student outcomes information is a challenge we all face. First, we must determine who needs what information, when, and in what form. Second, we must determine what procedures are required to obtain the desired information. And finally we must assess what is feasible given technical limitations, economic constraints, and political realities both within and outside the institution.

Academic departments in meeting this challenge often make use of institutional student records and survey questionnaires to gather student information. In some instances they develop their own instruments and in others they adopt different standardized questionnaires. However, one of the dilemmas they face as a result of their decisions is that their procedures usually provide information that is only quantitative in nature. While valuable, such information does not provide as complete a picture of students in terms of their backgrounds, ambitions, plans, activities, successes, failures, and their hopes and fears. Furthermore, the experiences of planners in industry, government, and education suggest that of the total amount of information used to make organizational and program decisions only ten to fifteen percent is quantitative with the rest of the information being qualitative.

With this situation in mind, how does an academic department develop and implement a comprehensive student outcomes information system that is feasible and that effectively obtains and uses quantitative and qualitative student outcomes data?

Over the last two years the Office of Institutional Research and Planning at Mercy College has been working with academic departments in the College to develop and implement such a comprehensive student outcomes information system. The purpose of the remainder of this paper is to describe this effort in terms of what has been done, who has been involved, and what are the realized and expected outcomes. In particular, it will address what was learned in terms of existing expectations and fears and the strategies for assisting academic departments in student outcomes assessment efforts. It also will provide some insights about how legitimacy of the effort was achieved in the eyes of the faculty and about some of the internal technical, political, motivational, and economic issues involved.

BACKGROUND

Most would agree that the most constant aspect of any college or university is change. Mercy College certainly is no exception. Established as a junior college for the training of young women entering religious life, the institution quickly grew into a baccalaureate degree-granting college in the early 1960's. Its first four year class graduated in 1965 with men being admitted four years later to a now, non-sectarian institution.

The year 1972 brought a new President. The enrollment at that time hovered around 1,500 students. Today the College enrolls approximately 9,500 students offering 27 undergraduate and one graduate program. Full-time faculty size has increased by 102% in just the last five years. Through all this, the basic mission remained unaltered while the delivery system changed dramatically. Clearly the need to assess the impact of these activities was warranted.

In 1978 the Dean for Academic Affairs created a Committee on Institutional Evaluation (IEC). The IEC comprised of faculty and selected administrators has as its purpose:

> ...to participate in the formulation of institutional evaluation, to advise the faculty with regard to ongoing institutional evaluation at the College and to make recommendations to the Dean or Faculty where appropriate.

In the Fall of 1980, the IEC recommended that the College begin a collegewide student outcomes assessment program, which would be carried out on an ongoing basis and would be coordinated by the College's Office of Institutional Research and Planning. This program was initiated in the Spring of 1981 by the administration of a set of student outcomes questionnaires (modified versions of the student outcomes questionnaires developed by the National Center for Higher Education Management Systems and The College Board) and a ten-year panel study of seventy-five new students at the College. While the IEC believed that it is important to examine collegewide impact on students, they also believed that it is equally, if not more, important to document and understand the impact individual academic departments have on students, both majors and nonmajors. As a result, the IEC recommended that each academic department begin its own student outcomes assessment for purposes of program planning and evaluation. In initiating this effort, the IEC established four basic assumptions which have proved critical for its long-term viability. The assumptions were:

- Faculty and administrators must be committed to understanding the outcomes/consequences of their efforts and to making use of this information for program planning purposes.
- Department outcomes assessments must be tailored to the needs of each department and should build upon existing departmental and institutional information gathering capabilities, i.e., "we don't want to reinvent the wheel.
- Departmental outcomes assessment efforts must be developed to meet standards of feasibility, practicality, and cost-effectiveness.
- The assessment procedures and instruments to be developed will be implemented on a continuing basis rather than a one-time only basis.

During the 1982-83 academic year, four departments were selected to participate in the departmental student outcomes assessment project. Only four were selected because it was felt that more attention could be given to a small group and this small group could serve as a model for the other departments when they would begin their student outcomes assessment projects.

WHAT WAS DONE?

Working through the Chair of the IEC, the Director of Institutional Research and a consultant, hired by the College to help facilitate this effort, arranged meetings with the respective departments to discuss their program evaluation and student outcomes information needs. Each session generally lasted about two hours with animated yet directed discussion about the different questions they hoped to answer with the results of their student outcomes assessment project. Listening to their ideas and concerns, each student outcomes related question was placed on a large sketch pad for closer examination. Following this meeting, the questions were translated into appropriate closed-and-open-ended questionnaire items that would be attached to the Collegewide student outcomes questionnaires, discussed above. These items were then sent back to each department for review. After further discussion, the Institutional Research office produced and distributed the questionnaire to each department's students and alumni. The office then analyzed the returned questionnaires. The findings then were returned to the respective department chairpersons for their final analysis prior to the production of a final departmental student outcomes assessment report.

WHAT WAS LEARNED?

Any project of this nature raises certain expectations and fears. From the academic departments' standpoint, expectations about what they would learn varied widely. In general, however, we learned that most hoped to receive the following kinds of information:

- Information about student satisfaction with courses and faculty.
- Information about the difference they were making.
- Information for evaluating achievement of departmental objectives.
- Information for marketing and image building.
- Information in a form they could understand.

Furthermore, we learned that the process needs to be feasible and fit into the traditions of the department. In terms of concerns or fears, we learned that for some there is a fear or "being discovered," (i.e., they are not sure about the positive nature of their impacts and they certainly don't want anyone else to find out). Also, it was confirmed again that some vagueness about outcomes is often preferred since it allows for greater degree of political freedom in arguing for program needs. Inevitably, the issue of comparison entered the discussion. Fear that we might not be doing as well as others was mentioned but not in those exact words.

The Academic Dean's expectations mirrored the faculty's as he sought to (1) establish a continuous review process and (2) build a case for an increased budget allocation for this purpose. A major fear on the Dean's part was that evaluation is often politically charged and might "blow up" creating administrative and faculty tension. As a result, it was important to proceed with much caution and much sensitivity.

The Institutional Research Office had several hopes and fears as well. The IR function in its present design sought legitimacy in the eyes of the faculty. The time spent establishing and maintaining credible data bases proved fruitful. There also was a desire to be viewed as a facilitator and not simply as a guardian of numbers. Two fears were (1) that reports/information might not be valued or used, and (2) an effort of this sort often breeds work overload without any increase in staff/resources.

STRATEGIES

Strategy simply defined is a pattern in the stream of actions or decisions which relate an organization to its environment. Based on the Mercy College experience concerning departmental student outcomes assessment, strategies for ensuring a successful academic departmental project of this type should include the following:

- Provide constant assurances that the process and product belong to the participating instructional unit.
- Allow for variation as to who is involved. In our study, participants varied with the chairs' style of governance. At times we met with entire departments, other times with committees, and once with just the chairperson.
- Departments should always have the "right of first refusal."
- Environment is a critical factor. The cost of walking across campus is worth the goodwill and "peace of mind" generated.
- Be honest and make reasonable promises and schedules. Few things damage a well conceived design like untimely and dated information. Don't "bite off more than you can chew."
- Do your homework by recognizing one's cognitive complexity -- his or her ability to digest and use the material provided.
- Take the time to study the chairperson's personality with respect to how he/she copes with information overload. What's the chair's communication style?
- Solicit from participants, personal memory and trusted others, information about the chairperson's past experiences with the information stimulus. New and more demanding information can be set accurately within existing frameworks of knowledge.
- Recognize individual motivations and needs as compared to the overall needs of the institution. The smaller the gap, the higher the success.
- Provide reminders to faculty that evaluation's principal aim is to improve the quality of the product or service. Our mutual goal was to place the department in a distinctive position. If a department can skillfully choose areas in which it has an advantage and then concentrates its resources in those areas, it can achieve excellence beyond expectation.
- Remind the faculty about opportunities to publish the study findings before their professional organizations.

CONCLUDING COMMENTS

To date the academic departments' responses have been favorable. Departments are beginning to get answers to important questions that deal with their interests and concerns about students. In several instances study findings have provided support for departmental beliefs, long held, yet not fully documented.

The participating departments have been patient and cooperative. We anticipate using their experiences to sell the process and results to other departments. Once institutional research established its legitimacy, the office was seen as having a responsibility to facilitate the process. Communications, cooperation and commitment are the cornerstones of success in any venture. Seems simple -- try it.

THE SECOND TIME AROUND: A STUDY OF RECIPIENTS OF SECOND BACCALAUREATES

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INTRODUCTION

University College is the continuing education campus of the University of Maryland with an annual enrollment of approximately 18,000 part-time students. Its primary mission is to serve non-traditional students in Maryland.

A recent study of May 1982 graduates of University College found that 49 students out of a graduating class of 438 had applied to receive a second bachelor's degree.

The purpose of studying this population of second bachelor's recipients was to obtain 1) a profile of their educational goals and characteristics and 2) their reasons for selecting a second bachelor's rather than an associate's or master's degree.

METHODOLOGY

Description of Materials

Two methods were used to collect data from the subjects. First, a Graduating Student Survey form consisted of 24 questions covering the following six topics: general information, enrollment information, educational plans, employment information, goal attainment, and evaluation of instruction and student services. The majority of the questions provided appropriate responses from which an answer had to be selected; some required filling in a response; and two questions provided responses to be evaluated on a summated rating scale.

The second method of data collection was a structured telephone interview which combined standardized and open-ended questions. The telephone interview questions covered two main topics: 1) obtaining the reasons the interviewee decided to seek a second bachelor's degree 2) determining whether prior to enrollment the interviewee had considered earning an associate's or master's degree instead of a second bachelor's.

Data Collection Procedures

In June 1982, 438 questionnaires were mailed to the May 1982 graduates of the University College Statewide Programs (graduates from the overseas programs were surveyed separately at a later date). Each questionnaire for the second bachelor's group was coded so it could be separated from the others when returned. A special cover letter accompanied each questionnaire explaining the purpose of the study and inviting graduates to volunteer for a follow-up telephone interview.

The overall response rate was 66 percent (289 questionnaires out of a total of 438). The response rate for the second bachelor's recipients was 73 percent (36 questionnaires returned out of 49); 13 of the 36 graduates volunteered to be interviewed.

ANALYSIS AND DISCUSSION OF THE DATA

The first step was to review specific data from the questionnaire sent to all May 1982 graduates of University College.

Demographic data for first and second bachelor's recipients were compiled and are presented in Table 1. A grouped frequency distribution for the ages of respondents shows that graduates receiving their first bachelor's tended to be slightly older than their contemporaries seeking a second bachelor's. The age group of 30-34 years had the largest number of first bachelor's respondents while the majority from the second bachelor's group were in the 25-29 years range. There were more males enrolled in the first degree programs and more females seeking second degrees. The data on marital status and race are included to provide a general profile of the respondents in this study but do not appear to contain any unusual findings.

Another question on the survey form lists typical goals of college students. Graduates were asked to indicate how much progress they thought they had made toward reaching those goals. Table 2 lists the 18 goal statements and the percentage of those who made "substantial progress" toward each goal. The Table provides a breakdown of responses for first and second bachelor's recipients at University College. The statement which had the most significance, with regard to this study, is about the goal "preparing for a new career." A total of 63.9 percent of second bachelor's recipients indicated they had made substantial progress toward this goal. For those who had received the first bachelor's, 24.7 percent claimed they had made substantial progress, while 35.0 percent declared that preparing for a new career was not a goal of theirs.

In the "career preparation" category, the second bachelor's

TABLE 1

DEMOGRAPHIC DATA FOR FIRST AND SECOND BACHELOR'S RECIPIENTS AT UNIVERSITY COLLEGE

	N=253 First Bachelor's		N=36 Second Bachelor's	
Age	%	N	%	N
Under 25	8.0	7	5.6	2
25 - 29	21.4	54	38.9	14
30 - 34	29.5	75	25.0	9
35 - 39	16.8	42	14.0	5
40 - 44	12.7	32	8.4	3
45 - 49	5.2	13	8.4	3
50 - 54	2.0	5	-	-
55 - 59	2.4	6	-	-
60 - 64	.8	2	-	-
65 and over	.4	1	-	-
No response	1.2	3	-	-
Sex				
Male	60.5	153	44.4	16
Female	39.5	100	55.6	20
Marital Status				
Married	68.4	173	58.3	21
Not Married	31.2	79	41.7	15
No Response	-	1	-	-
Race				
American Indian	.4	1	-	-
Asian	1.6	4	5.6	2
Black	14.2	36	5.6	2
Hispanic	1.2	3	2.8	1
White	81.4	206	86.1	31
Other	.4	1	-	-
No Response	.8	2	-	-

TABLE 2

UNIVERSITY COLLEGE GRADUATES WHO MADE SUBSTANTIAL PROGRESS TOWARD ATTAINMENT OF SELECTED GOALS

Goals	First Bachelor's Recipients N=253 % Making Progress	Second Bachelor's Recipients N=36 % Making Progress
Increasing my knowledge and understanding in an academic field.	72.9	72.2
Acquiring a general education.	62.4	28.6
Completing courses/ degree necessary to transfer to another educational institution.	26.3	20.6
Discovering career interests.	24.3	33.3
Formulating long-term career plans and/or goals.	31.3	50.0
Preparing for a new career.	24.7	63.9
Improving my knowledge, technical skills and/or competencies for my job or career.	46.8	52.9
Increasing my chances for a raise and/or promotion.	46.2	42.4
Meeting people.	24.1	11.1
Appreciating art, music and literature.	19.6	5.7
Understanding different cultures and philosophies.	21.1	5.7

TABLE 2 Cont.

Goals	First Bachelor's Recipients N=253 % Making Progress	Second Bachelor's Recipients N=35 % Making Progress
Learning to become a good citizen and to contribute to community affairs.	17.6	2.9
Improving my self-confidence.	49.4	31.4
Improving my leadership skills.	38.0	20.0
Becoming more skilled in meeting and relating to others.	40.3	17.1
Understanding my abilities, interests and limitations.	44.9	45.7
Learning skills that will enrich my daily life or make me a more complete person.	43.8	20.0
Developing my ability to be independent, self-reliant and adaptable.	45.9	30.6

recipients have stronger responses for all three career statements. In the "academic" category, a striking difference exists between the responses of first and second bachelor's recipients when asked about their progress in "acquiring a general education." Only 28.6 percent of the second bachelor's recipients indicated they had made substantial progress on this goal, but 62.4 percent of first degree recipients had made substantial progress. The general pattern of responses suggests that second bachelor's recipients are focusing more interest on career-related goals and less involvement with academic, social and personal development goals.

The responses of the 13 second bachelor's recipients who volunteered to be interviewed appear to confirm the data from the goal statements on the questionnaire. "Preparing for a new career" was rated (on an attitude scale) by 69.2 percent as a "very important" reason for completing the second bachelor's. The remaining 30.8 percent rated the same reason as being "important."

Two other questions were asked of those who participated in the telephone interview. Each interviewee was asked if he/she had considered enrolling in an associate's degree program instead of a second bachelor's. A review of the literature had indicated that some college graduates were returning to community colleges to obtain training for new careers. Of the 13 graduates interviewed, ten indicated that they had not considered an associate's degree. Of the three who had considered the associate's degree, two chose the second bachelor's because they felt it afforded greater recognition in the job market. One individual pursued both an associate's degree and the second bachelor's.

When asked if a master's degree had been considered instead of a second bachelor's, ten of the 13 interviewees indicated that they had. The reasons for selecting the second bachelor's over the master's are varied. Fifty percent, however, said the curriculum they needed (principally accounting) was available at the bachelor's level rather than the master's.

Since preparing for a new career was the most important reason for pursuing a second bachelor's degree, it may be helpful to look at the areas of concentration in which these second bachelor's recipients studied. Table 3 shows the areas of concentration for the first and second bachelor's, along with the year each degree was awarded. Business and Management with an accounting emphasis was selected by 38 percent of the second bachelor's recipients at University College.

CONCLUSIONS AND IMPLICATIONS

University College and other nontraditional institutions offering four-year academic programs for adults may want to identify the educational goals and characteristics of current and prospective students in order to develop programs and services for them. If it becomes apparent that enrollments for nontraditional students sharing a similar goal, such as obtaining a second bachelor's degree, are increasing, institutions concerned about maintaining enrollments need to be ready to indentify and address their needs.

This study may have implications for higher education institutions looking for new markets. If the number of college graduates returning to be retrained in new career fields is increasing, colleges, especially those which do not offer graduate programs,

TABLE 3

AREAS OF CONCENTRATION AND YEAR OF GRADUATION FOR FIRST AND SECOND BACHELOR'S DEGREES (N=36)

Student Code No.	First Bachelor's Area/Year		Second Bachelor's Area/Year*
1	Biology	1975	Business/Accounting
2	Business Ad.	1967	Business/Accounting
3	Business Ad.	1973	Fire Science
4	Chemistry	1967	Computer Science
5	Criminology	1975	Law Enforcement
6	Education	1962	Business/Accounting
7	Education	1968	Business/Accounting
8	Education	1969	Business/Accounting
9	Education	1971	Business
10	Education	1974	Business/Accounting
11	Education	1976	Computer Science
12	English	1972	Information Systems
13	English	1977	Business/Accounting
14	Foreign Lang.	1963	Computer Science
15	Geography	1972	Business
16	German	1978	Business
17	History	1972	Business/Accounting
18	History	1976	Business
19	Horticulture	1976	Computer Science
20	Information Sys.	1977	Business

*All second bachelor's degrees awarded in 1982

TABLE 3 Cont.

Student Code No.	First Bachelor's Area/Year		Second Bachelor's Area/Year
21	Interior Design	1974	Business/Accounting
22	Mathematics	1979	Computer Science
23	Microbiology	1976	Business/Accounting
24	Physics	1970	Economics
25	Political Sci.	1969	Business
26	Political Sci.	1979	Information Systems
27	Pre-Veterinary	1966	Political Science
28	Psychology	1974	Business/Accounting
29	Psychology	1979	Computer Science
30	Public Admin.	1977	Business/Accounting
31	Social Science	1972	Economics
32	Social Science	1975	Business
33	Sociology	1957	Business/Accounting
34	Sociology	1969	Art History
35	Sociology	1976	Business/Accounting
36	Zoology	1979	Computer Science

*All second bachelor's degrees awarded in 1982 may want to develop curricula designed to meet the needs of a changing economy. Designing second bachelor's curricula with enough flexibility to permit returning college graduates with varied undergraduate backgrounds to retrain in an expedient manner may prove beneficial to the individual, higher education and the labor force.

Academic Advising and the Nontraditional Student: Collecting Planning, Management, and Marketing Information From Student Intake Forms

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The fragmentation and shrinkage of the traditional college market are forcing post-secondary institutions to make changes to maintain enrollments. One such change is the growing tendency to include programs for part-time, nontraditional students such as adult learners seeking courses or degree programs for career enhancement.

Institutions pursuing this relatively new market have quickly learned that to court these educational consumers successfully, the curricula, delivery mechanisms, and student services provided need to be more than replicas of those offered for the younger, traditional student. This is particularly true of academic advisement, a key service in assisting the nontraditional learner to identify and clarify educational goals and develop strategies to reach these goals.

University College of the University of Maryland, modified its academic advisement program in 1979 to make it more responsive to the nontraditional student. At that time, University College established a centralized advising system open to University College students and non-University College students alike. Both groups are invited to "walk-in" for advising at their convenience or to make an appointment with an advisor of their choice. Advising services are available days and evenings at the main campus and by appointment at 25 sites around the state.

While such a service functions effectively in meeting the needs of working adults, it presents a number of challenges to the college. Effective management of information on students is imperative for the program to operate efficiently. This is particularly true for the non-University College student advisee who has no previous records that advisors can draw on to facilitate the advising session.

To enhance information flow, an Advising Intake Form is completed by students for each advising appointment. Data on students are collected in six categories: demographic information, educational history, current career field, personal and educational objectives, history of advising at University College, and reasons for seeing an advisor. In addition, students indicate where they learned about University College programs and specify preferences for locations where courses can be offered. Advisors note the location at which students were advised and record outcomes for the advising sessions.

There are several advantages to using this form. First, it allows a flexible advising program to function smoothly by providing advisors with needed information on students and nonstudents alike. Second, because the Advising Intake Form is machine readable (optically scanned), data can be compiled easily. Third, regular reports produced by the Office of Institutional Research provide management, marketing, and planning information to key administrators.

Since 1980, data from over 14,000 intake forms completed by advisees have been collected and stored in computer files. Translating these data into useful information in the areas of planning, management and marketing is discussed below.

PLANNING INFORMATION

Planning for Students

Walk-in advising and advising-by-appointment are heavily subscribed services at University College. In order to be responsive to both students and nonstudents alike, advisors work to maximize what is accomplished in such sessions. The The Advising Intake Form is an important tool in helping them to do this.

The Advising Intake Form enhances the advisor's ability to deal personally and efficiently with current students. While there are student records available for this type of advisee, the form further facilitates the session by collecting information on the purpose of this particular student visit. Advisors can then direct their remarks to issues of interest at the time of the visit.

At the end of the advising session the advisor notes on the form the types of services s/he provided for the student. All copies of the Advising Intake Form are retained in student files and any advisor who counsels the student in the future can see what kinds of services were previously provided. This eliminates the repetition of information about programs and services unless specifically requested by the student.

If the Advising Intake Form is facilitative in advising the current student, it is critical to successfully advising the non-University College student. One would be unable to offer an efficient advising service to such a student without an information-gathering tool of one kind or another. The Advising Intake Form makes meaningful information exchange possible within a brief period without requiring students to complete lengthier documents such as most application or registration forms.

The non-University College student, on completing the Advising Form, provides the advisor with a brief demographic and educational history, with information on educational objectives and career goals, and, as with the current student, reasons for scheduling the advising appointment. Using this information, the advisor can direct his/her remarks to the student's background and interests.

Planning for Advisors

The success of University College's open advising system lies in the flexibility of the advising staff. Unlike more traditional institutions where students are often advised by faculty within their areas of speciality, University College advisors must be able to speak to the requirements and program characteristics of all areas of concentration. Consequently, advisors are required to stay in touch with new programs, with adjustments in long-standing programs and, because University College students are career-oriented, with the requirements of numerous career fields.

In recent years, advocates of consumerism in education have recommended that colleges and universities conduct parallel needs assessments of their students and of employers. University College promotes this position and requires its advisors to remain current on issues relative to students' career concerns.

In this capacity, the Advising Intake Form serves as a type of needs assessment instrument. It informs advisors and senior staff of students' course/program interests. As students' needs and interests shift and as the kinds of advice they seek change, so does the type of in-service training provided for advisors. For example, after several years of high enrollments in business and management courses, advisors noted a shift in student interest to computer science and information systems management areas of concentration. Students began appearing with more and more technical questions about computer courses, questions which some advisors struggled to address. Now, as analyses of the Advising Intake Form show new interests on the part of current and potential students, new training programs are developed and provided to advising staff to enable them to discuss in depth the implications of completing different University College courses/degrees. Advisors are also able to advise students on the need to obtain specific areas of knowledge if they wish to compete successfully in certain career fields.

MANAGEMENT INFORMATION

Workload Management

At the end of each advising session, the advisor records his/her ID number on the intake form and how the session was resolved (i.e., what kinds of services were provided). Tabulating ID numbers provides a gross measure of advisor workload. For example, for the fall 1982 schedule period (July, August, September and October 1982), for individual advisors the percentage of students advised ranged from less than .1% (about 3 students) to 14.6% (about 438 students). Placed in the context of the advisors' other responsibilities, these data help the advisors manage their advising workload and determine whether they are spending an "appropriate" amount of time with students relative to other advisors.

Advisors also vary in the amount of time they spend with students in a session. Depending on their style and the student's needs, sessions may range from 20 minutes to one and one-half hours in length. Since some advisors spend a large part of their time advising off-campus, they may see fewer students than the advisor on campus. Supervisors use these data to help maintain workload equity for the advising staff.

Nonstudent Conversions

Both University College students and non-University College students (nonstudents) can avail themselves of advising services. Consequently, it is important for management to know what proportion of advising resources are being spent on these two populations. Advisees indicate on the intake form whether they have attended University College before. Analyses have shown that almost half of the students coming in to see an advisor indicate that they are not University College students. Of particular interest is whether or not students at some time do matriculate at University College. Of equal interest is the role that advising services play in the conversion of nonstudents into revenue producing, matriculating students. Since advisees indicate their social security number on the intake form, it is a relatively straightforward task to determine a conversion rate.

For example, from January 1981 through November 1982 approximately 14,062 Advising Intake Forms were completed. Removed from the computer file were: (1) records with missing SSN's (N=22); and, (2) duplicate records (where more than one intake form was completed by a student, the record from the earliest form was used). The resulting file that was matched with University College's student data base contained 10,352 cases. Of these, 3,267 or 31.6% reported on their advising forms that they never attended University College before. In other words, these 3,267 students had taken at least one credit with the college but they had indicated *at the time of advisement* that they were not a student. So while almost half of advisees are nonstudents, many of these individuals go on to become University College students and Advising Services may have played a role in this decision. Such information can be vitally important when it comes time to justify the expenditures of scarce resourses on student advising.

MARKETING

Although the Advising Intake Form was designed primarily to inform the academic advisors about the student, abundant marketing information can be derived from the data and put to use in planning effective programs and services.

Nonstudents

From a marketing point of view, nonstudents (advisees who complete the Advising Intake Form and have not matriculated at University College) merit close attention. Since about half (48%) are nonstudents, the intake form is the only source of information available on this group. A profile of this population, including demographic information, previous educational experience, career field, immediate educational objective, and major academic area of interest can easily be obtained from the computer file. With the profile in hand, administrators can respond more appropriately to nonstudents and provide for specific programmatic directions.

Advertising

A significant activity that falls within the purview of marketing is advertising. Advertising is considered to be those activities that make known to students and nonstudents the availability of programs and services at the college. Communicating with the nontraditional nonstudent can be very expensive depending on the medium chosen. It is, therefore, critically important to determine the most effective means of advertising, especially given the limited resources of most educational institutions.

In order provide some insight into what media have been effective, a question is included on the intake form which asks where the advisee heard about University College. The results for the fall 1982 schedule period are shown in Table 1. Included here are both University College students and nonstudents. The results reveal that non-personal media (e.g., radio/TV, newspaper, schedule, brochure) account for 32.4% of the responses while personal-oriented sources account for 52.8%. The data suggest strategies for various types of advertising campaigns. Each type of campaign might be vastly different in its approach, but similar in its outcome--increasing the information flow to potential students.

Table 1.

Where did you hear about University College?
(Fall 1982)

SOURCE	PERCENT RESPONSE	RESPONSES
NEWSPAPER	3.6	108
RADIO/TV	1.1	33
FRIEND	26.0	780
AT WORK	8.8	264
ACADEMIC ADVISOR	8.5	255
MILITARY ED. OFFICER	9.5	285
SCHEDULE OF CLASSES	18.8	564
BROCHURE	8.9	267
OTHER	14.9	447
Total	100.0	3,003

A further analysis of these data might focus on nonstudent respondents. It would be extremely important to determine their source of information about the college since advertising tends to focus on "new" clientele--new consumers who are to be considered the life blood of a nontraditional educational institution.

Marketing and Expressed Convenient Class Locations

It is widely recognized that nontraditional students will choose those schools that provide convenient locations for classes. It is therefore appropriate that soliciting locations convenient to the students and nonstudents be included in the intake form. The results of such information is provided to those offices principally concerned with scheduling and course site selection. With this information in hand, sound decisions can be made to the all-important questions to where to offer classes that are convenient to students. The results for the spring 1983 schedule period (the months of November, December, January, February and March) are shown in Table 2. Further analyses might examine the prefered location of nonstudents since their decision to attend or not could be based in part on the location(s) that would be convenient.

Table 2.

University College Location(s) most Convenient To You
(Spring 1983)

LOCATION	RESPONDENTS	PERCENT RESPONSES	PERCENT CASES
HARFORD/CECIL CO.	4	.1	.2
BALTIMORE	93	3.4	4.6
WESTERN MARYLAND	26	1.0	1.3
UPPER MONTGOMERY CO.	243	9.0	12.1
COLLEGE PARK	1539	56.9	76.4
HOWARD COUNTY	91	3.4	4.5
ANNE ARUNDEL CO.	200	7.4	9.9
PRINCE GEORGE'S CO.	217	8.0	10.8
SOUTHERN MARYLAND	44	1.6	2.2
UPPER EASTERN SHORE	4	.1	.2
LOWER EASTERN SHORE	1	.0	.0
DISTRICT OF COLUMBIA	118	4.4	5.9
NORTHERN VIRGINIA	127	4.7	6.3
TOTAL	2707	100.0	134.3

CONCLUSIONS

The Advising Intake Form has proven to be a useful tool to capture data and provide information to both advisors and managers. There are, however, limitations to the use of these data for decision making on the college level. Since advisees represent a self-selected population, it is not known to what extent they are representative of University College students as a whole. In some cases the presence of nonstudents in the group complicates the picture. Nevertheless, these data provide a solid piece of the planning and management puzzle that colleges serving nontraditional students must contend with in meeting the needs of their student populations.

REGISTRATION: A SYSTEM FOR MONITORING COURSE ENROLLMENTS

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ABSTRACT

A management information system is described that monitors course enrollments during an institutions registration cycle (pre-registration demand, pre-registration scheduling, cancellation for non-payment of bill, in-person registration, and add/drop). The information system utilizes the course registration process as an empirical data source for curriculum decision-making. The system provides the academic manager with information for making short and longer term decisions regarding enrollment trends, program migration, and institutional flexibility.

MANAGEMENT INFORMATION

Management information is essential for effective decision-making. The availability of timely and relevant management information, however, often requires a laborious "culling out" process in order to obtain the critical facts required for a given decision.

"Culling out" is necessitated by the excessive number of reports that reach the managers desk. More importantly, these reports are typically designed to support the operational aspects of the business, or to provide information to corporate headquarters, a governing board, or external agency. Most reports utilized by management, then, are not explicitly designed for the needs of the manager as a decision-maker (Rockart, 1979).

The essence of a decision-support system for management is that it is designed from the manager's perspective, and based upon a thoughtful analysis of the information requirements of the decision-making process. The identification of decision areas, and the design and implementation of an appropriate management information system, is not an easy task (Keen, 1980).

The primary function of such a system is to provide selective information to managers. Effective systems focus on institutional strengths and weaknesses with respect to critical success factors (Daniel, 1961). Critical success factors are those areas which, if satisfactory, "will ensure successful competitive performance for the organization" (Rockart, 1979). In most industries, there are three to six factors that determine success, such as tight control of manufacturing costs, new product development, and effective advertising. Critical success factors must be determined by the institution, and monitored by managers through the use of selective information systems.

COURSE OFFERINGS

In higher education, the curriculum is undoubtedly an important success factor. The distribution of course offerings, as well as the deployment of faculty, and other resources, is dependent to a considerable extent on the judgment of academic managers regarding student course demand trends. These judgments are frequently based on data that is "old," such as number of graduates by major area of study, or data that is "global", such as number of majors in each program at the institution.

REGISTRATION BENCHMARK METHODOLOGY

The registration process can be monitored to provide a continuing empirical data source for determining both short and longer-term patterns of student demand, student migration, and institutional adaptability. The methodology consists of collecting student enrollment data, on a course-by-course basis, at each phase of an institution's registration cycle: pre-registration demand, pre-registration scheduling, pre-registration adjustment cancellation (for nonpayment of bills), in-person registration, and schedule adjustment (add/drop). These enrollment phases provide a framework within which an institution can monitor individual courses, and collections of courses, and can predict the probable outcome of the registration cycle for its program offerings.

From a computer implementation perspective, benchmark processing requires the merging of course enrollment files at each phase of the registration cycle. An updated management report is produced at each phase.

A sample excerpt from the enrollment benchmark report for Management program courses is shown in Table 1.

ADVANTAGES OF REGISTRATION REPORTING FOR PLANNING

The registration reporting system provides managers with information that can be used directly for curriculum decision-making. The objective of the system is to eliminate impediments to planning inherent in existing reports. Specifically, the system provides improvements in report structure, including advantageous ordering of information, judicious selection of data elements, inclusion of several levels of summary totals, and, most importantly, temporal integration of information (see Table 1).

ORDERING OF INFORMATION

The registration report is designed to sequence course information in the most useful way, by ascending course number within program. The report is as compact as possible, minimizing wasted paper.

SELECTION OF DATA ELEMENTS

Only those data elements that provide essential management information relevant to course enrollment within the registration process are included. For example, student credit hours (SCH) and full-time equivalent (FTE) students represented by course enrollment are included. The data elements for instructor's name and social security number are intentionally excluded.

SUMMARY TOTALS

Subtotals are included for programs (see Table 1), as well as divisional and college totals. In addition, all subtotals and totals are displayed at the end of the report to simplify comparisons. All meaningful data elements summarized.

Table 1
Course Enrollment Benchmark Summary
Fall 1983
Course Totals

Course	Capacity	Initial Demand	After Pre-Reg.	After Cancels	After In-Person Reg.	Final	Capacity		SCH	FTE
							+-	PCT		
MGMT 3110 0001	30	37	30	27	30	35	+5	+16	140	8.75
MGMT 3110 0002	30	71	30	24	30	38	+8	+26	152	9.50
MGMT 3110 0003	30	90	30	27	30	36	+6	+20	144	9.00
MGMT 3110 0004	30	115	30	25	30	37	+7	+23	148	9.25
MGMT 3110 0005	30	33	30	23	30	36	+6	+20	144	9.00
MGMT 3110 0006 (C)	30		0	0	0	0	-	-	0	0.00
MGMT 3110 0007 (A)	30			0	29	38	+8	+26	152	9.50
MGMT 3110 0008 (A)	30			0	30	33	+3	+10	132	8.25
MGMT 3111 0001	30	29	26	22	29	29	-1	-3	116	7.25
MGMT 3120 0001	25	20	20	17	25	31	+6	+24	124	7.75
MGMT 3124 0001	30	38	30	25	30	40	+10	+33	160	10.00
MGMT 3124 0002	30	17	16	15	30	36	+6	+20	144	9.00
MGMT 3124 0003	30	8	7	6	30	31	+1	+3	124	7.75
MGMT 3124 0004	30	39	30	24	30	20	-10	-33	80	5.00
MGMT 3124 0005	30	47	30	28	30	29	-1	-3	116	7.25
MGMT 3124 0006 (A)	30			0	22	14	-16	-53	56	3.50
MGMT 4110 0001	30	43	30	25	30	41	+11	+36	164	10.25
MGMT 4112 0001 (C)	24	12	9	0	0	0	-	-	0	0.00
MGMT 4112 0002	24	22	17	15	24	25	+1	+4	100	6.25
MGMT 4112 0003	24	50	24	20	24	31	+7	+29	124	7.75
MGMT 4112 0004	24	32	20	15	24	24	+0	+0	96	6.00
MGMT 4112 0005	24	25	16	11	23	24	+0	+0	96	6.00
MGMT 4112 0006 (A)	24		0	0	24	24	+0	+0	96	6.00
MGMT 4871 8128 (A)	1					1	+0	+0	4	0.25
MGMT 4901 8129 (A)	1					1	+0	+0	4	0.25
MGMT 4918 8130 (A)	1					1	+0	+0	4	0.25
MGMT TOTAL	598	728	425	349	584	655	+57	+9	2620	163.75

TEMPORAL INTEGRATION

Course enrollments from all previous benchmarks within the semester are included in the most recent report. Thus, the final benchmark, produced after the add/drop period, shows, in addition to final enrollment, course enrollments at all previous benchmarks in the registration cycle.

For example, the course MGMT 3110, section 0004 (see Table 1), has a capacity of 30 students, a pre-registration demand of 115 students, and the following numbers of enrolled students: 30 after pre-registration scheduling, 25 after cancellation for (non-payment of bills), 30 after in-person registration, and 37 after add/drop (final). The final enrollment is +7 students (23%) above capacity, and represents 148 SCH, or 9.25 FTE students.

Note that the course, MGMT 3110, section 0006, was cancelled ("C"), before pre-registration. MGMT 3110, sections 0007 and 0008 were added ("A") for in-person registration.

Thus, benchmark reporting enables the academic manager to monitor course and program enrollments at all points in the registration cycle. The system supports management decisions related to addition of new courses (based on excess demand), cancellation of scheduled courses (based on low demand), altering course capacity, and redeployment of faculty resources.

TREND ANALYSIS

In addition to semester planning, multi-semester benchmark comparisons can be used as powerful tools in enrollment trend analysis and long range forecasting. These comparisons can be made by concatenating enrollments SCH, and/or FTE for several semesters, as shown below.

Fall Semester	CAP	DMD	PRE-REG	CANC	IN-PERSON	FINAL
MGMT 1981	450	339	238	200	374	372
MGMT 1982	540	538	326	248	453	519
MGMT 1983	559	728	425	349	384	655

For example, for all courses in the management program in Fall 1981 and Fall 1982, initial capacity exceeded final enrollment (1981: 450 vs. 372; 1982: 540 vs. 519). However, in Fall 1983, initial capacity (559), although increased from the previous year, could not accommodate final enrollment (655). The accommodation was achieved, in part, by the addition of MGMT courses during the registration cycle (Table 1). Thus, the institution was able to adapt its course offerings to help meet a rising student demand. However, the fact that student demand (728) exceeded final enrollment (655) suggests that some students were "closed out" of MGMT courses.

The Fall 1983 data also suggests that selective increases in MGMT course offerings would improve the success rate of pre-registrants, allow space for new students (who enter the process at the in-person benchmark), and reduce the extent of add/drop activity.

SUMMARY

An information system was described which is expressly designed to support the academic manager in curriculum decision-making. The system utilizes empirical data derived from course and program registration. The resulting report is concise, contains relevant information only, and achieves temporal integration of information.

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STUDENT PATTERNS IN COMPLETING GENERAL EDUCATION REQUIREMENTS

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With the reintroduction of general education distribution requirements in an era of declining resources, it is important to plan and evaluate such requirements carefully. In particular, if any one of several courses may satisfy one distribution requirement, one must consider the impact of student choice when implementing and evaluating the general education plan. Student choice can affect a general education program in three ways.

1. Student preferences can create bottlenecks. If students show a strong preference for just a few courses of the many available, those who are "closed out" of them may wait to enroll in them later rather than choose another course to satisfy the same requirement. If students prefer to put off completing some requirements until their junior and senior years, upper- and lowerclassmen will compete for spaces in the same courses. Both these situations can result in bottlenecks of unfulfilled demand.

Careful planning is essential to averting these problems. Offering too few of the general education courses that students prefer or improperly advising students to delay fulfilling requirements may create bottlenecks of student demand. Offering too many general education courses, however, means that precious faculty resources will be needlessly taken away from more advanced courses. Such planning cannot be done, however, without information on which general education courses students elect and when they take them.

2. Student preferences can create student frustration. In an era of

declining enrollment, it is also increasingly important that student progress through degree programs be monitored carefully, so that student difficulties, dissatisfaction, frustration, and possible attrition are all kept to a minimum. Planning can relieve student frustration by initiating a clearer explanation of the rationale of such programs, by clarifying appropriate and inappropriate course choices, and by planning course offerings to relieve bottlenecks. Again, however, it requires information on patterns in completing general education distribution requirements.

3. Student preferences can create actual course patterns quite different from the intent of the general education program. If most students, for example, fulfill a science distribution requirement by taking only biology courses, one must question the success of the requirement in exposing most students to the sciences. Student preferences can also prevent students from benefitting from the planned general-to-specific flow of their college program.

Collecting information on patterns in student choice can help curriculum planners revise general education distribution requirements so student experiences better match the intent of the program.

PURPOSE

The purpose of the study was to determine student choices in completing recently initiated general education distribution requirements at a public four-year college. The requirements for students in B.A. degree programs consist of two mathematics courses, three natural science courses, three social science courses (including a two-course "sequence"), three humanities courses (including a two-course sequence) and a two-course Western heritage sequence. The requirements for students in B.S. degree programs are identical except that no Western heritage courses are required and the three social science courses need not include a sequence.

The study had two specific objectives: (1) to determine which general education requirements students choose to complete during their freshman and sophomore years and (2) to identify the specific courses students choose to complete the three required sequences.

LITERATURE REVIEW

More and more colleges today are reintroducing general education distribution requirements (Gros-Louis, 1981). Indeed, according to Kramer (1981), 95% of the nation's colleges have general education distribution requirements. Distribution requirements usually entail "a core of courses--usually a predictable cluster of five or six requirements" (O'Banion & Shaw, 1982, p. 69), chosen from single-discipline, subject-centered courses (Hammons, Thomas, & Ward, 1980).

Gaff (1980), has noted that distribution requirements must be carefully implemented and evaluated. He observes that general education programs can involve substantial reallocations of resources and suggests than an initial general education program be considered only a trial run.

There has been little mention in the literature, however, of the need to consider the impact of student choice in evaluating distribution requirements. Vars (1982) in fact feels that an advantage of the distribution-requirements approach to general education is that such requirements utilize existing courses and permit scheduling to be accomplished in the "usual manner" (p. 218). He apparently assumes that the imposition of general education distribution requirements will have no impact on course enrollments--the assumption this paper challenges.

The problem of student choice is addressed by Smith and Clarke (1980) in the context of student-designed majors. They note that such programs can disrupt a college's system of resource allocation and reduce the accuracy of planning procedures that try to predict student flow. It seems likely that distribution requirements, which are also driven by student choice, would encounter the same planning difficulties.

METHOD

The Permanent Record Cards of a random sample of 129 Fall, 1982, juniors who entered this college as freshmen (with six or fewer transfer hours) were studied. Since course choices could vary substantially by major, the sample was stratified accordingly.

For each student in the sample, we identified which general education courses were completed during the freshman and sophomore years. The principal data analysis consisted of describing the percent of students in the sample completing each distribution requirement. Since a review of the data indicated differences among five cohorts of student majors--Communication Studies majors, Business majors, Education majors, students with other majors, and students without a declared major--the second analysis was a description of the percents of students within each cohort completing each requirement. The final data analysis consisted of describing the percents of students choosing various course sequences. A 95% confidence-level error margin was calculated for each sample percent.

RESULTS

Most of the sample completed most distribution requirements during their freshman and sophomore years (Table 1). The main exception: only a third of our sample completed the humanities distribution requirements. Within cohorts, there were additional requirements that many students were not completing in a timely fashion. Only a third of the Business majors had completed the natural sciences distribution requirement, less than half of the Education majors had taken the second mathematics course, and less than half the undeclared majors

Table 1

General Education Requirements Completed by the End of the Sophomore Year

	Major											
	Comm. Studies		Business Admin.		Education		All other		Undeclared		Total sample	
Requirement completed	f	%	f	%	f	%	f	%	f	%	f	%
Math I	23	92%	16	84%	30	94%	31	89%	16	89%	116	90%
Math II	18	72%	19	100%	18	56%	29	83%	17	94%	101	78%
Western heritage:												
No courses completed	5	20%	n/a		n/a		9	26%	10	56%	n/a	
Only 1 course compltd.	1	4%	n/a		n/a		7	20%	1	6%	n/a	
Complete req. compltd.	19*	76%	n/a		n/a		19	54%	7*	39%	n/a	
Humanities:												
No courses completed	0	0%	3	16%	1	3%	2	6%	1	6%	7	5%
Only 1 course compltd.	4	16%	3	16%	12	38%	7	20%	3	17%	29	22%
Only 2 courses compltd.	12	48%	7	37%	8	25%	16	46%	8	44%	51	40%
2-crse seq. compltd.	11*	44%	9	47%	12	38%	14*	40%	7	39%	53	41%
Complete req. compltd.	9	36%	6	32%	11	35%	10	29%	6	33%	42	33%
Social sciences:												
No courses completed	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Only 1 course compltd.	1	4%	0	0%	2	6%	2	6%	0	0%	5	4%
Only 2 courses compltd.	5	20%	0	0%	8	25%	5	14%	6	33%	24	19%
2-crse seq. compltd.	20	80%	n/a		n/a		30	86%	12	67%	n/a	
Complete req. compltd.	19	76%	19	100%	22	69%	28	80%	12	67%	100	78%
Natural sciences:												
No courses completed	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Only 1 course compltd.	2	8%	4	21%	7	22%	2	6%	1	6%	16	12%
Only 2 courses compltd.	8	32%	9	47%	13	41%	8	23%	4	22%	42	33%
Complete req. compltd.	15	60%	6	32%	12	38%	25	71%	13	72%	71	55%
All requirements	2	8%	2	11%	7	22%	3	9%	1	6%	15	12%
Sample size	25	100%	19	100%	32	100%	35	100%	18	100%	129	100%
Error margin no more than		±20%		±22%		±17%		±17%		±24%		± 4%

*Some of these students (3 Comm. Studies, 1 undeclared, and 1 other) completed history courses for the humanities sequence and the Western heritage sequence, even though taking two sequences in one department is not permitted.

had begun the Western heritage sequence.

Students had definite preferences for courses to complete the sequence requirements (Table 2). Over 40% of those completing the social sciences sequence took two courses in psychology and over half of those completing the humanities sequence took two courses in U. S. history. Since an additional third of the sample completed the Western heritage sequence by taking two Western heritage courses offered by the history department, it appears that nearly 90% of our students are taking two history courses to fulfill general education distribution requirements.

DISCUSSION

This study was designed to be descriptive and not to determine why students made the choices they did. Further study is needed to determine why many students did not complete the humanities requirements and why certain cohorts did not complete other requirements. Discussion within the college community is also needed to determine if the strong preference for history courses over other humanities and Western heritage sequences matches the intent of the general education program.

The results of this study demonstrate the need to consider the impact of student choice when implementing and evaluating a general education program. Student choices can create bottlenecks even though plenty of courses may be available, can keep students from benefitting from a general-to-specific flow in their college programs, and can permit students to fulfill general education distribution requirements with course patterns different from those intended by the program.

This study also provides a baseline of data against which other colleges might compare themselves. It would be interesting to know, for example, if there is a similar strong preference for history courses at other schools and

Table 2

General Education Sequences Most Frequently Completed

	Number of students completing	
Sequence	f	%
Western heritage:	(50)	(100%)
HIST 230-231 (Western Heritage)	19*	38%
ENG 210-211 (Literature)	13	26%
TH 260-261 (History of Western Theatre)	7	14%
ART 250-251 (Survey of Art)	6	12%
PHIL 235-236 (History of Philosophy)	5	10%
Humanities:	(54)	(100%)
HIST 102-103 (History of the U. S.)	30*	56%
ELED 106-107 (Public School in American Life)	5	9%
Two courses in French	4	7%
Two courses in Spanish	4	7%
All other combinations (no more than one person in each)	11	20%
Social sciences:	(87)	(100%)
PSYC 100-200 (Human Behavior/Life-Span Devel. Psych.)	37	43%
SOC 100-250 (Intro. Sociology/Structure of Amer. Society)	20	23%
ECON 100-101 (Macroeconomics/Microeconomics)	16	18%
ANTH 100-250 (General Anthropology/Comparative Societies)	4	5%
PS 100-105 (Intro Poli. Sci./ Amer. Politics and Govt.)	4	5%
ANTH 100-280 (General Anthropology/Human Evolution)	3	3%
PS 100-109 (Intro. Poli. Sci./International Politics)	3	3%

*Some of these students (3 Comm. Studies, 1 undeclared, and 1 other) completed history courses for the humanities sequence and the Western heritage sequence, even though taking two sequences in one department is not permitted.

if other Business majors put off natural science courses.

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Retention/Attrition

COLLEGE STUDENT RETENTION: MEASUREMENT OF THE RELATIVE IMPORTANCE OF CAUSAL FACTORS

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In two previous articles (Aitken, 1982) we have presented a four equation model of college student adjustment and retention. The capstone equation to the model was the retention equation itself which was based on the premise that a student's decision to remain at a specific institution is directly determined by major aspects of the student's experience (along with the possible intervention of major external factors). The present article makes use of this equation to explore two new research areas. The first part of the article compares retention equations estimated from two different samples of freshmen students from different years. Secondly, results are reported for an expanded version of the retention equation which incorporates a number of new factors.

DATA

Data for the study was obtained from two different surveys of representative samples of freshmen students at the University of Massachusetts, Amherst. The survey data was combined with the student's grade point average for the freshman year and information on whether or not the student returned to the University at the beginning of their sophomore year. The first survey was administered at the end of the fall semester, 1977 and the data from the survey along with grade point average were used to predict student retention as of the fall semester, 1978. The second survey was administered at the end of the fall semester, 1980 and was used, along with GPA, to predict student retention as of the fall semester, 1981. The retention rate exhibited by the 1978 and 1981 samples are 81.8% and 82.9% respectively.

THEORETICAL VARIABLES

The theoretical basis for the estimated equation can be summarized in the following general equation;

$$\text{Retention (R)} = a_0 + a_1AS + a_2LS + a_3AP + a_4EI + a_5EF + u$$

Where student retention by a specific institution (R) is assumed to be a function of the student's satisfaction with the academic program (AS), satisfaction with the living environment (LS), the student's academic performance (AP), the level of involvement in extracurricular activities (EI), and external factors (EF). Academic performance is assumed to directly affect withdrawal decisions not only because institutions set a minimum level of academic performance, which must be met in order for the student to remain in the institution, but also because the institutional measure of academic performance provides a direct message as to how well the student is doing relative to both the student's peers and an absolute standard. Extracurricular activities provide an additional source of student satisfaction, and since participation is voluntary, the degree of satisfaction is assumed to be closely correlated with the extent of involvement. Finally, external factors refer to major factors outside of the university experience such as severe personal injury or illness, or family or personal problems, which may force the student to withdraw from the institution. EF, therefore, is hypothesized to have a negative effect on R (i.e., the value of a_5 is negative). The lower case letters ($a_0 \ldots a_5$) are parameters to be estimated empirically while u is a random error term.

REGRESSION RESULTS

1978 versus 1981

The empirical results previously obtained for 1978 (Aitken, Jan./Feb., 1982) are reported in Table 1 along with the new results for 1981. Whether or not the student returned for the second academic year was used as the dependent variable. The independent variables are listed in Table 1 along with the regression results. Academic performance was introduced in two forms to represent two different effects: (1) a dummy variable indicating whether or not the student had achieved the minimum grade point average (GPA) required for eventual graduation and (2) the student's actual GPA. The first represents what might be called the "hurdle effect" imposed by the university, while the second captures the reward or positive feedback of the grading system. Both variables were statistically significant in both years. The potential effect of external factors was introduced in the dual form of the extent of student concern with (1) family/personal problems and (2) financial problems. The primary concern in evaluating the results is whether there is a significant change in the coefficients from 1978 to 1981. The t values reported in the right-hand column suggest that two significant changes have occurred. The intercept value increased significantly over the period and the coefficient for meeting the university minimum grade requirement declined significantly. Further analysis, however, suggests that the latter result may be spurious. Because the two variables "meet GPA requirement" and "actual GPA" are highly correlated ($r = .77$) the values of their individual coefficients are unreliable, which is defined as the problem of multicollinearity. Because both variables clearly belong in the equation (they are theoretically sound and statistically significant), only the sum of the two coefficients can be examined

TABLE 1

Regression Results for First Year Student Retention[a]
1978 versus 1981

Independent Variable	Regression Coefficients		t-Value For Difference
	1978[b]	1981[c]	
Meet GPA requirement[d]	.275*	.135*	2.46†
Actual GPA	.068*	.125*	1.90
Residential living satisfaction	.048*	.049*	0.06
Academic satisfaction	.050*	.011	1.77
Concern with family-personal problems	-.023*	-.006	1.21
Activity involvement	.042	.002	0.95
Concern with financial problems	.002	-.016*	1.40
Intercept	.453*	.710*	2.73†

[a] Student registered for the fall term of the second academic year (registered = 1; did not register = 0).

[b] For 1978 equation: N=892; R=.440; R^2=.194.

[c] For 1981 equation: N=1535; R=.414; R^2=.172.

[d] Dummy variable for GPA> or <2.00.

*Statistically significant coefficients.

†Indicates a statistically significant difference between the 1978 and 1981 coefficients.

for changes over time. Because the coefficient for "actual GPA" increased almost as much as the "GPA requirement" coefficient declined, there was only a small change in the sum of the two coefficients over the period (from .34 in 1978 to .26 in 1981). Consequently, the only significant change over the period was in the intercept which means that the role played by the variables themselves was fairly stable. At the very most, it could be argued that in terms of determining retention, there was a slight decline in the role played by grades as well as academic satisfaction and concern with family/personal problems. At the same time, there was a slight increase in the role played by financial problems.

Expanded Equation

Results for the expanded equation are reported in Table 2. With the exception of the two GPA variables, all variables in the equation were measured by survey responses obtained during the fall semester, 1980. The equation contains three completely new variables: (1) the extent to which the student felt socially isolated, (2) whether or not the student planned, at the beginning of the freshman year, to transfer to another institution, and (3) whether or not the student was employed at an off-campus job. In addition, two previously existing variables were redefined or measured differently. Concern with financial problems was replaced by the percentage of the student's total educational expenses which were financed through financial aid (grants or loans). The broadly defined variable of student participation in extracurricular activities (any activity) was replaced with the more narrowly defined variable of fraternity/sorority membership. The remaining variables are the same as previously defined.

TABLE 2

Regression Results for First Year Student Retention[a]--1981 Expanded Equation

Independent Variable	Stand. Reg. Coefficient	Unstand Reg. Coefficient	t-value
Actual GPA	.254	.122	6.37[*]
Meet GPA requirement[b]	.160	.141	4.24[*]
Social isolation[c]	-.110	-.058	4.18[*]
Planned transfer to another institution	-.087	-.099	3.64[*]
Financial aid[d]	-.071	-.085	2.97[†]
Residential living satisfaction	.059	.031	2.35[+]
Off-campus job	-.043	-.055	1.79
Fraternity/sorority	.035	.080	1.46
Concern with family-personal problems	-.021	-.006	.86
Academic satisfaction	-.017	-.010	.66

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[a] Student registered for the fall term of the second academic year (registered = 1; did not register = 0) N = 1421; R = .444; R^2 = .197. Under heading "Unstandardized Regression Coefficient" intercept = .4567.

[b] Dummy variable for GPA>or<2.00.

[c] An index comprised of four questions designed to measure the extent to which the student felt isolated and lonely.

[d] Percentage of students' total educational expenses financed by financial aid, grants, or loans.

[*] p<.001

[†] p<.01

[+] p<.05

The results show both GPA variables, social isolation, planned transfer to another institution, financial aid, and residential living satisfaction are all statistically significant and have the expected sign. Both off-campus jobs and fraternity/sorority membership have the correct sign and a relatively large t-value, but are not quite statistically significant. Finally, concern with family/personal problems and academic satisfaction are not even close to being statistically significant and academic satisfaction even has a negative value which is contrary to theoretical expectation.

In addition to the results reported in Table 2, several different versions of the regression equation were attempted. While space limitations prevent the full reporting of additional results, it is possible to list the additional variables which were not found to be statistically significant. None of the following variables were even close to being statistically significant when placed in a regression equation along with the variables listed in Table 2: (1) whether or not a brother or sister had attended the University, (2) whether or not the student's parent or parents had attended the University, (3) whether or not the student participated in a varsity or junior varsity sport, (4) sex of the student, (5) whether or not the student was admitted to his or her choice of major, (6) family size of the student, and (7) whether or not the student was employed at an on-campus job.

Policy Implications

The general policy implications of the study are relatively straight forward. For the University to significantly improve its retention rate, it must either improve student academic performance, improve student social integration, or increase financial aid. Academic performance could presumably be improved by either attracting "better" students or by designing programs to improve the academic skills of existing students. As to which specific policies or programs might be most effective in each of the three general policy areas, the study results provide no information.

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A Study of Attrition in the Regents External Degree Program

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Introduction:

The purpose of this paper is to discuss the problems associated with determining attrition rates and causes in an external degree program. The Regents External Degree Program (REX) of the University of the State of New York is the oldest and largest national external degree program in the country. The program currently offers eight degrees: two associate degrees and two baccalaureate degrees in the arts and sciences, two associate degrees in nursing, and baccalaureate degrees in business and nursing. Over 50,000 students are or have been involved in the program since its beginning. About 16,000 are currently active candidates.

The REX program is based on the concept that what a person knows is more important than how or where the knowledge is acquired. Its central mission is to provide an opportunity for earning a college degree to academically able individuals at low cost, regardless of age, place of residence, prior educational credentials, or constraints imposed by occupation. The program implements this mission by offering academic recognition in the form of credit and degrees to students who have demonstrated college-level learning through examinations, college coursework completed through other accredited academic institutions, and/or other approved means.

DEFINING A REX DROPOUT

Most studies of attrition or retention focus on defining who is a dropout, and discovering when a student is most likely to dropout. However, these questions become difficult to answer in an external degree program. REX differs from other more traditional colleges in that it offers no direct instruction. The program does not reside on a traditional campus with faculty or students. Instead, an administrative staff is located in Albany, and faculty and students may be located anywhere in the United States and in some cases overseas.

Students may enroll in the program at any time during the year. There are no clear-cut semesters or breaks. The staff in Albany assesses students' learning on a continuous basis through several means, including the verification of transcripts and the development of tests of college-level learning. Dropping out of the program is not necessarily related to current or previous coursework or test performance. However, dropping out may mean that the services REX offers to its students are not meeting their needs.

For the purposes of program record keeping, students are defined as having dropped out of the program if they have not paid their annual records fee (ARF) within a set amount of time. The annual records fee is similar to a registration fee, and is paid yearly on the anniversary of the student's enrollment. Currently, if the student does not pay within four months, he is recorded as inactive in the computer files, and his records are separated from the other active or graduated students. Prior to 1982, students had an extra year to pay the annual records fee. Thus these earlier students had not paid a fee in two years before their status changed. Using this system, it is impossible to pinpoint when a student becomes inactive. A broad range of time exists when students may have decided to leave the program; we only can determine when they decide not to re-register.

Figure 1 shows this process of going inactive based on non-payment of annual records fees.

Figure 1

Enrollment ----	ARF notice mailed ----	ARF notice mailed again ----	Fee status changed
provides enrollment data and date	one year after enrollment	two months after first notice	candidate moved to inactive file

RATE OF ATTRITION

The rate of attrition is determined on a yearly basis by degree program. Table 1 indicates the attrition pattern compiled over the last eight years. In the table, attrition figures are compared to the total number of active and graduated students for these same years.

TABLE 1

Total Enrollment and Graduation Statistics

Degree Program	Enrolled: Active	%	Enrolled: Inactive	%	Graduated	%	Totals
Associate in Arts (Liberal Arts)	1067	16	1695	25	4084	59	6846
Associate in Science (Liberal Arts)	1659	18	1741	18	6027	64	9427
Associate in Applied Science (Nursing)	1332	27	3025	62	532	11	4889
Associate in Science (Nursing)	2136	41	2097	40	954	18	5187
Bachelor of Science (Nursing)	4544	50	4143	46	397	4	9084
Bachelor of Arts (Liberal Arts)	1442	31	1706	36	1572	33	4720
Bachelor of Science (Liberal Arts)	3429	28	4450	36	4545	36	12,424
Bachelor of Science (Business; Subject Concentration Option)	1368	31	2809	64	179	4	4356
Bachelor of Science (General Business Option)	893	42	993	47	222	11	2108
Regents Credit Bank	372	51	358	49	--	--	730
Totals	18,242	31	23,017	39	18,512	31	59,771

CHARACTERISTICS OF INACTIVE STUDENTS

Information about inactive students was collected in three stages. In the first stage, a sample of inactive candidates was randomly selected from the population of all identified inactive candidates, from the beginning of the program through summer of 1981. Approximately 2500 inactive candidates were mailed a questionnaire asking them why they became inactive, and how satisfied they were with REX. The second stage involved mailing a similar questionnaire to a sample of candidates who were known to have become inactive between 1981 and Fall of 1982. These candidates were also asked why they chose to become inactive, and how satisfied they were with the program.

The third phase involves mailing a questionnaire to candidates as they become inactive. The questionnaires are mailed out on a monthly basis. Again this questionnaire asks candidates why they have become inactive, and how they rate the program.

1981 Candidate/Graduate Study

The sampling of inactive candidates for the 1981 study was part of a larger study called the 1981 Candidate/Graduate Study. For this study, a sample of candidates was selected in May of 1981 from the three types of candidates in REX: actives, inactives and graduates. Active candidates and graduates were selected from 1977 onward; inactive candidates were selected from the entire span of the program. The candidates within these three basic groups were further broken down into five degree program categories: The Associate Degrees in Arts and Sciences, the Associate in Science and the Associate in Applied Science (nursing), the Bachelors Degrees in Arts and Sciences, the Bachelor of Science (nursing), and the Bachelor of Science (business). A systematic sample was drawn from each of these five degree program categories within the three basic groups, creating 15 sample cells. The number of active candidates and graduates sampled was approximately 10%, excluding graduates of the Bachelor of Science in Nursing and Bachelor of Science in Business groups. In those two groups the number of graduates was small so the entire population was used. Approximately 15% - 20% of the inactive population was sampled because a lower response rate was anticipated.

Each inactive student selected for the sample was mailed a four-page questionnaire that contained questions about the candidate himself, previous education, occupation and views of selected program policies.

Many of the survey forms were undeliverable. This is most probably due to the fact that the addresses were at least two years old. Addresses of inactive students are not updated. The overall response rate of those forms that were deliverable was 27%, varying from 19% for Business Degree students to 32% for Baccalaureate Nursing Degree students.

The characteristics of inactive respondents did not vary greatly from active or graduate respondents, or from the sample as a whole. One exception was gender. Although males and females comprise equal percentages of the active and inactive students, the groups differ for graduates. In the graduate population, 81% are men and 19% are women. Also, graduates are more likely to be on active military duty. Inactive candidates did not differ greatly in occupation or educational background from actives or graduates either. Most held a job in the professional/technical area, and had completed some college prior to enrolling.

In the 1981 study, inactive candidates were asked several questions that dealt specifically with becoming inactive, as well as questions about education and occupation. The results of these statements are summarized in Table 2. No reason stands out as being selected by all groups. The statement "Could not earn the credit I expected for my life or work experience" earned a proportionately high rating, as did the statements, "Decided to attend another institution", "Could not continue due to sickness, accident, or life crisis", and "Not enough time to study and work at the same time." A relatively large proportion of the Bachelor of Science in Nursing candidates chose "Could not transfer all the credits I expected for coursework from the schools I attended" though almost none of the Associate degree nursing candidates rated this as important.

Inactive candidates were also asked to indicate their level of agreement with a series of positively worded statements about the program. As in the survey form for active candidates, the questions were divided into four categories: written materials, advising, examinations and opinions. Inactive candidates generally had a higher rate of "Don't Know/Never Use" responses to these statements. Again, candidates in the nursing programs were more familiar with the examinations, and were generally satisfied with their content. Inactive nursing candidates did have a higher rate of dissatisfaction with the study guides and with information provided upon test failure.

TABLE 2

Most Important Reason for Becoming Inactive

	AA/AS %	ADN %	BA/BS %	BSN %	BBUS %
Most important reason for becoming inactive					
No response	22	29	21	21	33
Could not earn the credit I expected for my life or work experience.	12	4	10	10	11
Had too many problems with the program.	5	8	7	5	5
Degree requirements were more difficult than I anticipated.	1	--	4	3	--
Had to make too many decisions by myself about my academic program.	1	2	4	3	3
Decided that I disliked studying independently.	--	2	1	3	2
Could not transfer all the credits I expected for course-work from the schools I attended.	1	--	5	13	3
Just wanted to get a transcript with all my credits on it.	3	--	--	--	--
Decided I didn't want or need a college degree.	--	--	2	1	--
Decided to attend another institution.	11	4	4	9	5
Failed examinations and/or courses.	1	4	2	--	--
Wanted more contact with other students.	--	--	--	1	--
Not enough money to pay for records fees, courses and/or examinations.	8	8	7	5	6

-continued-

TABLE 2 (continued)

	AA/AS %	ADN %	BA/BS %	BSN %	BBUS %
Most important reason for becoming inactive					
Was unable to get sufficient financial aid.	--	3	--	--	3
Could not continue due to sickness, accident or life crisis.	3	11	6	3	2
Not enough time to study and work at the same time.	11	1	4	7	8
Not enough time to study and meet my family committtments.	1	4	4	2	3
Other	20	18	21	15	17

Inactive candidates in general had a higher disagreement rate on the opinion questions. Although they did not receive as many questions, they generally had disagreement rates of about 20% - 30%, compared to rates of 10% - 15% for active candidates.

1982 Follow-up

In the Fall of 1982 a survey form was sent to respondents to the 1981 survey to see how they had progressed in their studies. All respondents to the 1981 survey who were active in the program at that time were used in the sample. The active candidates were broken down into three groups: those who became inactive during the last year, and those who graduated during the last year. Each of these groups was again broken down into five degree program components.

A total of 206 candidates who had become inactive responded to the survey. Their responses were compared to inactive candidates in 1981. Nine of the most frequently chosen reasons for becoming inactive by candidates responding to the 1981 survey were included on the 1982 survey form. The responses of each group to those reasons are listed in Table 3. As can be seen, the most important reason listed by the 1982 inactives becoming inactive was lack of money.

TABLE 3

Comparison of 1981 and 1982 Inactives:

Most Important Reasons for Becoming Inactive

	1981 Inactives (n=428) %	1982 Inactives (n=206) %
Could not earn the credit I expected for my work or life experience	9	6
Had too many problems with the program (e.g., poor advisement, delays in receiving materials, etc.)	6	9
Had to make too many decisions by myself about my academic program	3	1
Could not transfer all the credits I expected from the schools I attended ,	5	9
Decided to attend another institution	7	9
Not enough money to pay for fees, courses, and/or examinations	7	27
Not enough time to study and work at the same time	6	6
Not enough time to study and meet my family commitments	3	2
Other	16	22

As in 1981, the candidates who became inactive in 1982 tended to have a higher disagreement rate on opinion questions than candidates who had remained active or graduated.

1983 Study of Inactives

In 1983 it was decided that it would be appropriate to survey students as they became inactive. Thus beginning in March surveys were sent each month to students right after their fee status changed. These surveys contained questions that were similar to those used in the 1981 Candidate/Graduate survey and its 1982 follow-up.

The responses to these surveys are summarized here for March through September. Overall, 27% of the students (658) have responded to the survey so far. Unlike the previous surveys, only 9% of the surveys were undeliverable.

The characteristics of these newly inactive students are similar to the previous two groups. Twenty-nine percent view themselves as only temporarily inactive, while another 27% plan to re-enroll sometime in the future. Only 16% do not plan to obtain a degree through REX. Most of these inactive students are not enrolled in another college or university (55%). However, many plan eventually to obtain at least a baccalaureate degree (32%).

As with all REX students, the large majority are employed (86%). The largest number work in a professional/technical area (30%) or a service occupation (24%). The percentages are similar to those obtained from other surveys of REX students.

These new inactive candidates tended to disagree with the statements about the program more frequently than actives or graduates. Inactives in the nursing program were more likely to think that the current fee structure is inappropriate. This most probably reflects the fact that some Nursing examinations are expensive. Inactives in the Business Degree Program were more likely to think that the program did not apply many of their previously earned credits to their degree requirements as they expected. As a whole, more of these inactives also disagreed with the statement that the degree requirements were flexible enough to meet their needs than previous groups of inactives.

As with the other groups of inactives, these inactives were asked why they decided to become inactive. Their responses are summarized in Table 4. Students could choose more than one reason for becoming inactive. Again, many candidates stated that they did not have enough money to pay for records, fees, courses or examinations. Several of these students stated that they had changed their priorities and did not budget money for these expenses. Many of the 1982 inactives also felt that they did not have enough time to study and work at the same time.

TABLE 4

1983 Inactives: Reasons for Becoming Inactive

	Nursing Degree Program (n=291) %	Business Degree Program (n=87) %	Arts & Sciences (n=280) %
Could not earn the credit I expected for my life or work experiences	15	17	20
Had too many problems with the program	15	16	21
Had to make too many decisions by myself about my academic program	12	8	9
Could not transfer all the credits I expected for coursework for the schools I attended	16	23	26
Decided to attend another institution	18	17	15
Not enough money to pay for records fees, courses, and/or examinations	46	32	31
Not enough time to study and work at the same time	22	25	23
Not enough time to study and and meet my family commitments	19	20	15
Requirements were too inflexible	--	10	--
Found examinations too difficult	16	8	--
Graduate school would not admit me if I graduated from your program	3	--	--
State I live in would not let me take state boards as a graduate of REX	2	--	--
Other	51	43	42

DISCUSSION

The decision to drop out of the REX program, or become inactive, is not necessarily related to typical causes of college attrition. It is related to the belief that REX's services are no longer useful to the student.

To determine why REX services were no longer perceived as useful, several comparisons were made between inactives and acitves and graduates, and among different groups of inactives. On the whole, inactives were similar to other students on variables such as age, gender, educational background and occupational status. They do not seem to have specific needs related to these areas that the program is unable to meet. However, they do tend to disagree with general policy statements more often than either actives or graduates. In particular inactives feel that the fees charged by the program are inappropriate, and that they did not receive enough credit for their previous educational work.

The reasons chosen by inactives to explain why they became inactive parallel these two areas of disagreement. The most frequently cited reason was lack of funds for fees and examinations. A word of caution should be injected here. Many candidates noted that they did not think that REX in general was too expensive. Rather, they did not want to budget money for REX expenses at this time. Some were waiting to complete more coursework before re-enrolling. Others had life changes, such as loss of employment, that necessitated a change in monetary priorities. Still others cited lack of time as the real problem. These groups tended to state they were only temporarily inactive, and planned to re-enroll when these outside situations improved.

An exception to this were Nursing Program inactives. This group of inactives tended to state that the Professional Performance Examinations were too costly and the failure rate was too high. This group was more likely to say that they did not plan to re-enroll.

Not earning enough credit for life or work experiences was also a major reason cited for becoming inactive. These students, many of who are in the military, felt that they should have earned credit for work or experience even if it was not translatable into college credits. Since this is in direct opposition to REX policy, these students were generally unhappy with the program and tended to say that they did not plan to re-enroll.

As might be expected, inactives that were contacted soon after they choose not to pay their annual records fee tended to have more strongly negative feelings about program policies. They were also more likely to state that they did not have enough time to work and study, and so dropped their studies.

On the whole, REX students tended to state that they left the program either when they were short of time or money. Some also left when they discovered that REX did not award credit for life experiences. REX students did not complain about REX services; they did complain of pressures outside of REX that forced them to postpone or abandon their studies. The exception to this was the group of students in the Nursing Program who felt that the cost of nursing examinations was excessive, and the the examinations were too difficult.

The Role of Institutional Reasearch in Student Retention and Campus Renewal

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In the age of dwindling resources and an ever decreasing pool of high school graduates an institutionally orchestrated student retention program can be one of the most effective survival strategies. In addition to the obvious benefit of holding more students to graduation, a campus-wide retention effort can bring about institutional renewal and lay the foundation for long-range strategic planning. The role of the institutional researcher is central to the success of the retention effort itself and to the other activities flowing naturally from it. The institutional researcher can identify the number and types of students leaving the college, inform the campus community about important studies found in the abundant literature on college student attrition, help devise intrusive retention strategies and design research projects to evaluate their effectiveness, and assist in developing a consensus for defining the institution's mission and long-range plans.

WHY RETENTION IS IMPORTANT

There are few who work in the administration of a college who have or could have a better view of the attrition problem at their own institution than those employed in the office of institutional research. The researcher may have been supplying this data to policy-makers on a routine basis for years and observed, as a response to unacceptably high attrition, more concentrated recruitment and marketing techniques. In the main, entrenched managers of colleges or corporations will find it difficult to conduct a systematic self-examination because it will be their decisions that may be found to have been misguided. Thus, the natural response will be to ignore or pay cursory attention to the researcher who calls for an internal self-evaluation of the institution as a way to address the attrition problem.

Depending on the type of institution, freshmen attrition alone can range from 45% at community colleges to 27% at four-year private colleges (Beal and Noel, 1980). A case can easily be made, from the researcher's point of view, that the costs of recruiting new students to replace those who have dropped out are likely to be higher in the long run than the costs incurred by a sound retention program. In other words, it can be shown that in addition to the obvious relationship between attrition and enrollment there is a significant drain on institutional resources to prospect for new students. Supporting this view are notable authorities such as Alexander Astin who says, "While administrators and faculty have traditionally seen recruitment as a principle means to keeping enrollment up, an equally promising approach is to reduce dropout rates...investing resources to prevent dropping out may be more "cost effective" than applying the same resources to more vigorous recruitment." (Astin 1975, p.2) This point can be made even more dramatically when the researcher projects the number of high school students from feeder institutions who will graduate in the next ten years. Nationally, the decline in high school graduates will reach 20% by 1995 and in an industrialized northeastern state such as Massachusetts the "bottom will fall out" with a decline of 42%. (Chronicle of Higher Education, 1982)

The institutional researcher can make an even more dramatic case by distributing information about the number and types of colleges that have closed in the last 20 years. Between 1960 and 1981 a total of 236 schools closed: 91 private two-year, 35 public two-year, 109 private four-year, and one public four-year college.(NCES, 1983) If those in key decision-making positions are not convinced that it may be well worth the pain of introspection to address the retention problem, then the institutional researcher may wish to provide an analysis of the encroachment of competitors in markets traditionally reserved for their institution. Within a ten-year period Massasoit Community College in southeastern Massachusetts found itself directly competing for students with two private junior colleges, three public community colleges, two state and one private four-year school, and two public universities; not to mention all the public and private institutions of higher education in Boston. The case can be made, especially at institutions vulnerable to competitors, that sound retention strategies may be more cost effective than recruitment strategies and point the way to better resource allocation.

For those who work with data and make informed trend projections in the office of institutional research, there is another reponsibility. This responsibility of the researcher is to call into question, should the data indicate, the moral obligation of an educational institution to students highly prone to dropping out. To the extent that certain attrition behaviors are within the capacity of a college to correct, there is an obligation to change aspects of an institution's environment which operate to discourage learning and persistence. Essentially, the researcher asks the basic questions:

What is a dropout?

Who drops out?

When do they drop out?

Why do they drop out?

What can the institution do to prevent students from dropping out as much as they do?

Finding answers to these questions will take the researcher to the very heart of the college enterprise - student development. Professionally and politically there is no capital to be made by undertaking this task without widespread, top to bottom, support; that is, if action leading to improvement is the goal. The best first step in a retention plan is most likely to be identifying and categorizing the subjects of a potential study.

THE WHAT, WHEN, WHO, AND WHY OF DROPPING OUT

In order to identify dropout behavior it is important to reach clarity with respect to both definitions and the range of dropout behavior to to studied. Although universally accepted definitions are not available, the literature on attrition suggests the following (Lenning, Beal, Sauer, 1980):

Persister -	a student enrolled without interruption and who graduates within three years with an A.A. degree or within five years with a B.A. degree.

Stopout - a student who leaves and then returns to graduate from the same college.

Dropout - a student who leaves a college never to return.

Retention - when a student completes or continues formal study at the institution in which he/she originally enrolled.

Attrition - when a student is no longer enrolled.

Employing these definitions or a variation of them will direct the researcher in tracking the progress of individuals through the institution. Attempts to work with aggregate data based on sheer numbers not returning or withdrawing will prove to be misleading. Each student must be followed in his/her path through the collegiate environment.

Much can be learned during a preliminary scanning of dropout data, if the time of the dropout's departure is established. The effort to establish when students leave will provide clues for corrective measures. The categories in the following list help to identify these points of departure:

Admitted, never registered
Registered, no show
Stopped attending classes
Officially withdrew
Didn't register for subsequent term
Didn't register after X terms

Was academically dismissed

Once an operational definition is determined and the "time of departure" parameters set, the institution needs to know if there are any common characteristics shared by the persisters and by the non-persisters. The researcher has the task of developing a profile of the dropout-prone. There are ample studies on this subject. One of the most notable is the one reported by Alexander Astin in Preventing Students from Dropping Out. Here and in other research reviewed by Cope and Hannah (1975); Lenning, Beal, and Sauer (1980); Pantages and Creedon (1978), Ramist (1981), the researcher is well advised to concentrate on factors seen in the past to contribute to the profile of a dropout:

Demographic Factors Related to Attrition

Low level of parental education

Economically disadvantaged

Hispanic

Graduate from small rural high school

Graduate of public high school

Academic Factors Related to Attrition

Poor high school grades

Low rank in high school class

Low academic aptitude

High school rated low

Poor study habits

Motivational Factors Related to Attrition

No advanced degree aspirations

Dissimilar beliefs and attitudes compared to those of peer group

Unclear vocational aspirations

Unwilling to endure dissatisfaction

Wish to transfer at time of entrance

The "when" and "who" of the attrition issue need not be closely connected with a theoretical model. Investigators seeking to answer the question, "Why do students dropout?" must, however, contend with theoretical considerations to guide the development of a conceptual model out of which certain data rather than others are collected. An example of such a structural model is suggested by Aitken (1982). The model is a representation of the congruency theory of persistence proposed by Spady (1970) and Tinto (1975). Simply stated the theory predicts that students will persist if they are successfully integrated into the intellectual and social systems of the college. Aitken builds a simple model (1) from this theory:

(1) Retention = Academic Integration + Social Integration + Random Error

alternatively stated:

(2) Attrition = Academic Incongruity + Social Incongruity + Random Error

The search for an answer to, "Why do students dropout?" involves a decision about which proxy variables will best serve to substitute for the abstract theoretical variables of academic and social integration or incongruity. Empirically measurable proxy variables may then by selected within this theoretical context. Some variables to consider are:

Academic Integration Measures

Number of courses attempted vs. number of courses completed

First semester freshmen GPA

Participation in Honors Program

Student evaluation of academic environment (survey)

Social Integration Measures

Residence hall satisfaction (survey)

Extracurricular participation (survey)

Social interaction with faculty (survey)

After tracking individual students and determining who they are, when they dropout, and why they leave according to a theoretical model, the institutional researcher is ready to plant the seeds for the next phase of what could be a promising campus-wide retention effort. Once the data is collected and interpreted by the researcher, the critical step is to have someone take the findings seriously enough to launch an honest institutional self-study. The evidence, however, must be compelling!

INSTITUTIONAL SELF-STUDY AND RENEWAL

If the evidence is overwhelmingly indicative of a college in need of self-examination and redirection, then the researcher must be able to help manage the mood for change. The potential exists to destroy efforts at institutional renewal before they are ever launched simply by the careless use of language in rendering a report to policy-makers on student attrition. Bare facts in the hands of insecure administrators may lead to an outbreak of acrimony in which research findings are employed to isolate and accuse certain members of the college community that it is they who are responsible for the high dropout rate. The researcher in writing an attrition report must be mindful of how this sensitive data could be used to draw battle lines rather than open the lines of communication. If the focus of attention is too narrow, if the problems identified are reported as unidimensional and the obvious responsibility of a small group, then it is unlikely that the broadly based campus support required for searching introspection will ever come about. Increasing student persisitence must be seen to be everyone's business and everyone must be shown that they have a stake in the solutions.

CONCLUSION

Ultimately, improvement in the learning and social environment of a college and better college services for students are probably the best hedges against the problem of attrition. When and to what extent these improvements ought to take place in the career of a student is not within the sole purview of the institutional researcher. The role of the institutional researcher in promoting meaningful change is one of a catalyst. Breaking the bad news about a serious retention problem has the potential for promoting fruitful dialogue which cuts across divisional lines and vertical stratifications; but it all depends on the skill of the messenger.

Mobilizing a campus community to look at itself through what it does to students in their comings and goings engenders sober reflection. From this turn inward can spring a renewed sense of mission and produce the enthusiasm necessary to bring about coordinated plans and well orchestrated actions.

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Departmental Studies

INTERDEPARTMENTAL DETERMINANTS OF ACADEMIC PROMOTIONS

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Introduction

As educational institutions leave the period of growth and move into one of stabilization self evaluation assumes greater importance. It is suggested that one area of self evaluation might involve determinants of interdepartmental academic promotions.

Three criteria most frequently assessed for faculty promotion are research, teaching and service. Measurement is subjective as there are no absolute values involved. Generally faculty committees and administrators evaluate and decide upon all requests for promotion and tenure notifying the concerned faculty member of their decision in his/her case. The faculty member learns little of the committee's deliberations and learns nothing tangible concerning his/her case in relation to other committee decisions. Part of the reason lies in the confidential nature of the deliberations and the difficulty in quantifying the criteria.

An attempt to quantify the criteria would seem important, therefore, to obtain substantive data on actual promotional and tenure practices. Thus faculty members could compare their efforts in an anonymous way with interdepartmental peers. Such data would reveal also if teaching, research and service are the criteria used for promotion and tenure.

Three data categories lending themselves to a degree of objective measure involve publications, student evaluations and citations. The number of publications provide the most frequently used measure for promotion (Batista, 1976). While there is ample debate over the question of whether publications should be counted there is little argument over the fact that publications can be counted. On the other hand, student evaluations on the whole lack overall conformity and general acceptance. Most student evaluations, however, include three "universal" questions which are generally acceptable. One universal question asks,"Without regard to the subject matter, how would you compare this teacher to others you've had?" This question can be quantified and does represent a view of the classroom teaching from the student's perspective. A publication usage index (PUI) has been suggested (Dyer, 1982) as a way of assessing a publication's impact in the field and giving another quantifiable measure.

Data Categories

Using two data categories (publications and student evaluations) Science and Humanities faculty members from the Liberal Arts College of a large state university were studied for the five years prior to their promotion. Science departments included the departments of microbiology, botany, chemistry, geology, physics, physiology and zoology. The Humanity departments included the departments of English, Philosophy, History and Sociology. The decade between 1969 and 1979 was chosen.

Since all information used was public information the year, 1979, was the final year in which bibliographies were freely available at this university. Each group consisted of 63 subjects, both men and women, promoted to the three academic ranks.

Sources for faculty publication lists included annual reviews plus research and scholarship faculty directories. Student evaluations were those conducted by the students, printed and available in the library or from student governments. The Citation Index volumes of Science Citation Index and Arts and Humanities Citation Index were used. These volumes provide an author listing followed by a list of the published articles and years in which he/she has been acknowledged by a citation.

Procedure

Publications were counted and used as one data category. Citation counts were divided by years to provide a yearly citation rate. The citation rate was divided by the yearly publication rate to obtain the publication usage index.

The student evaluation question was the universal question mentioned previously. A mean score was determined from all evaluations an instructor may have had during the five years prior to promotion. Not all faculty had student evaluations.

The Student's t-test was used to test the null hypothesis that there are no differences between the Humanities and Sciences on the basis of publication counts, publication usage index or student evaluations.

Results

As seen in Table 1 a significant difference ($\alpha=0.001$) was found in the publication counts of the Humanities and Science Departments in favor of the Sciences. The mean publication count per year was 2.6 for the Humanities and 9.6 for the Sciences.

Table 1 shows a significant difference in student evaluations ($\alpha=0.016$) between the Humanities and Sciences in favor of the Humanities. On a scale of 1 (highest) to 5 (lowest) the means were 1.95 for the Humanities and 2.34 for the sciences.

The Publication Usage Index does not reveal significance ($\alpha=0.112$)

Discussion

While the publication count is significantly greater for the sciences the contribution of the Humanities should not be considered lightly. A yearly publication rate of 2.6 is prodigious. J. R. Cole (1979) found prolific men in the physical, biological and social sciences have a publication rate of 24 papers in 12 years. With this point in mind the yearly publication rate for the Sciences (9.6) is truly amazing.

It is interesting to note that the Humanities do not publish as much as the Science departments although they require little research instrumentation or funding. The reverse would be expected. Although the reasons were not determined we can speculate. Perhaps this difference reflects current

TABLE 1

STUDENT'S t-TEST

	HUMANITIES	SCIENCE
Student Evaluations		
Number	43	49
Mean	1.95	2.34
Std. Dev.	0.57	0.79
	t=-2.465*	
Publications		
Number	63	62
Mean	2.6	9.6
Std. Dev.	3.7	7.5
	t=-6.679*	
PUI		
Number	7	7
Mean	2.2	10.7
Std. Dev.	2.0	12.0
	t=-1.863	

* significant
$\alpha = 0.05$

activity in the discipline. Perhaps sophisticated instrumentation heightens enthusiasm. Perhaps in order to obtain external funding more publications are needed. Whatever the reason the fact that the faculty members in the science departments are publishing 3½ times as many papers per year for the five year prior to promotion remains. How this difference is handled in faculty status committees is unknown.

The statistically significant difference the disciplines saw in response to the universal question could lead to sweeping generalizations. Perhaps this indicates different thinking strategies may be required by the different disciplines. Perhaps it indicates the student's familiarity with subject matter he/she may have had throughout the entire school experience. For example, the mean rating for English and History instructors were higher than the mean ratings for Sociology or Philosophy (1.8 and 2.3 respectively.) Caution must prevail, however, since only one question was asked.

A much more extensive study would be required to determine if there really is a difference as indicated here. It would be interesting to determine if a student's perception of instruction differs between the Humanities and Sciences or if Humanities instructors are just "better teachers". Note worthy is the fact that teachers in both disciplines are "good teachers" with means of 1.95 and 2.34 on a scale of 1-5.

The lack of significance ($\alpha = 0.112$) in the Publication Usage Index may be due to the small sample number (N=7). The sample size was severely limited since publication of of the Arts and Humanities Citation Index only began in 1976.

This study was conducted at a large, state institution and revealed large differences in publication counts and some differences in student evaluations for different departments in the same college. It is not unrealistic to assume that differences occur between departments in other colleges and leads to some basic questions. Are teaching, research and service weighted departmentally to insure equality of effort for promotion through the academic ranks? Given these departmental differences and changes in committee membership are faculty status committees being consistant over time?

These questions can only be answered in a statistical manner by departments of institutional research which could have access to these data. It is most important from an academic standpoint that this information be available in planning for the next decade.

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PREDICTORS OF DEPARTMENT VIABILITY IN PERIODS OF DECLINE

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Institutions of higher education are now or will soon be confronted with financial stress caused by declining enrollments and increased competition for governmental resources. Those responsible for the administration of these institutions - legislators, trustees, presidents, deans, etc. - are being forced to make increasingly difficult decisions concerning resource allocation.

This paper will focus on resource allocation within the institution: that is, the distribution of resources to departments by the college or university. The term viability is used in the title to convey the sense that departments are engaged in a struggle to protect and preserve themselves against cutbacks; viability in this context is a reflection of the ability of academic departments to maintain or increase their share of the resources allocated by the central governing board. Predictors are certain characteristics which can be empirically associated with the proportion of the institution's resources obtained by individual departments.

CHARACTERISTICS OF DECISION MAKING

Before examining these characteristics it is necessary to review how the decision making process changes as the resource level changes. Rubin (1977), in her reseach on five midwestern universities, found that decision making became more centralized under conditions of resource scarcity. This was evidenced by the fact that appointment decisions and program proposals were being reviewed at higher levels in the institutions. Departments were in competition with each other for limited personnel and equipment, where previously most reasonable requests were honored. This fits in nicely with Cyert and March's earlier (1963) research on allocation procedures within a firm where resource levels had dropped. Cyert and March argue that organization leaders become more concerned with the organization as a whole, and subunit (departmental) goals are given lesser priority. This is important because the subunits are actively trying to protect their budget level. Charles Levine refers to this as the Participation Paradox. He explains:

> The field of organizational development teaches that the best way to manage change is to encourage the maximum amount of participation by all the affected parties. But, a rational cutback process will require that some people and programs be asked to take greater cuts than others. By encouraging participation, management also encourages protective behavior by those most likely to be hurt the most. The participation paradox confronts management with a nearly insoluble problem: how does one single out units for large sacrifices who have people participating in the cut process? (1979, p.181).

The solution to Levine's rhetorical question might be to avoid putting extra pressure on subunits by having the central administration take responsibility for cutback decisions.

It ought to be noted at this point that those scholars conducting research on this characteristic and those that follow did have opportunities to observe a relative drop in resource allocation to institutions of higher education across the nation. Up until the the early 1970's there was a great deal of expansion in higher education and state governments were quite generous to colleges and universities. Researchers in Illinois (Salancik and Pfeffer, 1974; Pfeffer and Salancik, 1974; Rubin, 1977), Minnesota (Hills and Mahoney, 1978), California (Pfeffer and Moore, 1980a, 1980b; Chaffee, 1980), and in the East (Lodahl and Gordon, 1972) were able to divide clearly the periods of resource abundance and scarcity in the states where their field work was conducted. Thus "conditions of resource scarcity" refers to the post-1972 (1975 in some of the studies) period.

A second characteristic of decision making where there is resource scarcity is the change of emphasis on the subunit or department level from excellence and growth to maintenance and survival; this is discussed at great length by Rubin (1977), Cyert (1978), and Levine (1978, 1979). Related to this was the finding that risk and innovation were reduced. As Rubin states:

> When department heads were asked the best strategies for increasing their budget during the retrenchment period they replied they had strategies to protect the the level of budget, but not to increase it. They felt that if they tried to increase their budgets they could end up worse off than they already were. Finally, some reported that they had stopped competing for funds for innovation. The competition was so keen that the likelihood of success was too small to motivate the effort involved with writing up proposals. (1977, p.253).

Departments such as these, according to Cyert, do not want to be "squeaky wheels" for fear that the administration will use that squeakiness against them. The departments, he feels, view themselves as better off by being "unobtrusive wheels" (1978, p.348).

A third characteristic of decision making under conditions of resource scarcity is the need for better information about a decision's consequences for the organization as a whole. Decision making, according to Weick (1979), is often satsficing: that is, acting upon sufficient and available knowledge as opposed to complete knowledge. Solutions to problems are sought only until an adequate but not necessarily optimal answer is found. In colleges and universities, examples of this would be to blame the admissions office if enrollment were down, or to fire the president if fund raising fell short (Cyert, 1978). This was sufficient when there were enough slack resources available to produce "win-win consensus-building solutionsand side payments to overcome resistance" (Levine, 1978, p.317). When resource scarcity precluded this, administrators indicated to Rubin (1977) that there were two basic reasons that they felt they needed more information: first, they could not afford (either financially or politically) to make mistakes. Secondly, they were increasingly put into positions where they had to justify their rationale for making decisions to their staff and supervisors.

Thus, adminstrators are seeking more information about how to adapt to lower resource allocations while departments are trying to preserve the status quo. With this in mind it might be appropriate for decision makers to examine the "status quo" more closely. Several organizational theorists have done so, for the purpose of identifying departmental characteristics which influence resource allocation. While most of the studies of interest were conducted at colleges and universities, some important and relevant research was done using data from hospitals and the United Way, and when appropriate, these will be referred to also.

PREDICTORS OF BUDGET ALLOCATION

There is little doubt in the literature that the best predictor of a department's budget allocation is the previous year's allocation. This was found to be true for higher education by Pfeffer and Salancik (1974), Hills and Mahoney (1978), and Pfeffer and Moore (1980a). Pfeffer and Leong (1977) found it was also true for United Way agencies in Illinois. Budgets did not start with a zero-base, but with the previous budget, to which an increment (or decrement) was awarded. Hills and Mahoney (1977) used the amount of the increment as the dependent variable in their research while the others mentioned above used the entire allocation. Hills and Mahoney's rationale for using just the increment is that such a measure shows only the change in allocation; the rationale for using the entire departmental allocation (as a proportion of the university's total allocations) is that the base allocation had to be the result of something, and using the entire budget, not just the increment, is of more value in identifying the departmental characteristics influencing the budget.

These departmental characteristics which were found to be related to the proportion of the budget allocated to individual departments can be divided into three categories: rational, political, and structural.

Rational

A rational* criterion is one for which there is agreement as to its legitimacy and measurement. In the case of allocations to departments, student enrollment and instructional units fall into this category. Pfeffer and Salancik (1974), Pfeffer and Moore (1980b), and Rubin (1977) all used individual departments' proportional share of the total university enrollment as a predictor of each department's proportional share of the total university allocations; all found significant relationships (for example, $r=.67$, $p \leq .01$, for Pfeffer and Moore). Pfeffer and Salancik (1974) and Hills and Mahoney (1978) used instructional units (the number of students taught multiplied by the number of credit hours per course) for the same purpose, and also found significant results.

Both of these measurements represent student demand for courses in the department and there is little argument that in many institutions they are believed to be the sole criteria for allocations. There are, however, several other characteristics which are strong predictors of budget allocations.

Political

The second group of characteristics infuencing resource allocations are those considered as part of the political decision making model. Central to this is the notion of power, a concept not easily defined but intuitively real. A very basic definition is offered by Pfeffer: power is the "capability of one social actor to overcome resistance in achieving a desired object or result" (1981, p.2). For the purpose of the present study, the power model developed by Pfeffer and Salancik (1974) and then replicated by Pfeffer and Moore (1980b) should be appropriate:

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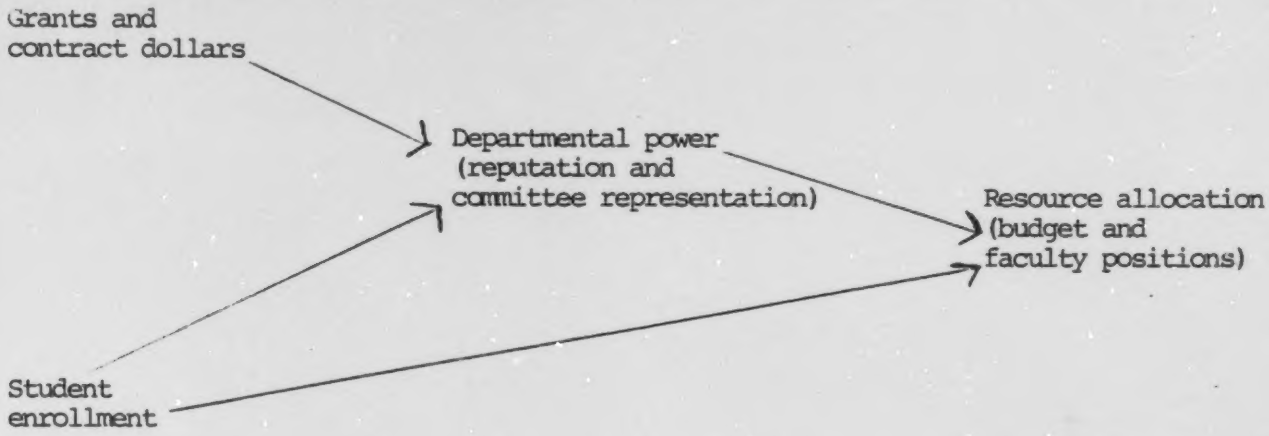
* For a complete discussion of rational decision making models, see Pfeffer, 1981, chapter one.


Grants and contract dollars
Departmental power (reputation and committee representation)
Resource allocation (budget and faculty positions)
Student enrollment

Model of Power in Decisions on Budget Allocations (Pfeffer and Moore, 1980b, p.638)

Grants and contracts add to a department's power base for several reasons. First, there is generally some form of competition to receive them and thus the procurement of grants and contracts enhances the reputation of the "winning" department. Also, while grants and contracts are awarded to faculty members within departments, the central administration receives a percentage of the award to cover administrative overhead costs. The university or college is dependent upon individual departments to the extent that they are able to attract outside dollars. Thus the more money a department has access to outside the institution, the greater the power that department has in relation to the other departments and the institution as a whole. This was found to be true by Salancik and Pfeffer (1974), Pfeffer and Salancik (1974), Hills and Mahoney (1978), Chaffee (1980), and Pfeffer and Moore (1980b).

Student enrollment contributes to departmental power in a manner similar to grants and contracts. The operating funds for the college or university come from the state (public institutions) and from tuition income (public and independent institutions), often on a per student basis. Departments which can attract more students to the institution add to the income of the institution, thus increasing those departments' importance. This hypothesis was supported in the same studies discussed above.

It was thought by Salancik and Pfeffer (1974) that the national prestige or reputation of a department might be related to departmental power. No effect was found. In their replication of this original study, Pfeffer and Moore (1980b) obtained the same result; they found no measurable relationship between power and reputation, nor between resource allocation and reputation.

Committee representation on those committees responsible for budget decisions, educational development and policy, research, and graduate studies was found to be a very important element in the model. It is highly correlated with all the other eleemnts of the diagram, and it is a significant factor in the regression equations of Pfeffer and Salancik (1974) and Pfeffer and Moore (1980b) predicting resource allocation from power and enrollment.

Up to this point the notion of personal power has not been addressed. That is, what is the effect, if any, of the ability of an individual department chairperson, faculty member, or committee member on departmental power or resource allocation? For the most part, such individuals will channel those personal abilities through a model such as that on the previous page. They will use their personal skills to attract grants and students, thereby increasing the power of their departments and the allocation of resources within the institution. Such individuals would presumably have a great deal of power within their own departments; how such a notion could be operationalized or what its implications would be for hiring would be an interesting research project in itself.

Power, then, in this context of resource allocation within colleges and universities, is a function of the dependency that exists between individual departments and institutions: the more dependent the institution is on the department to attract funding and students, the greater the power that department has within the institution.*

Structural

The final characteristic that will be discussed is structural in nature. It deals with the internal arrangement of departments and is generally referred to as paradigm development.

The degree of paradigm develpoment associated with a particular academic discipline (usually a physical or social science field) refers to the real or perceived amount of consensus regarding certain aspects of the discipline. Walmsly and Zald, discussing public administration theory, define a paradigm as something that...

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* Pfeffer and Leong (1977) is an excellent example of how this type of dependency relationship operates. Though their research here is on United Way agencies, the principles and conclusions are certainly transferable to higher education.

> ... represents a consensus for a field of inquiry. It provides decision rules for a discipline, and sets out a logic or conceptual map by which one proceeds to analyze and from which one draws inferences. It creates and is created by a distinctive coherent research tradition. Basic tenets of the field remain unquestioned, while work is limited to the solution of paradigmatic puzzles (1973, p.2).

Lodahl and Gordon (1972) define paradigm as the "...degree of consensus or sharing of beliefs within a scientific field about theory, methodology, techniques, and problems" (p.58). They operationalized the concept of paradigm by measuring the degree to which consensus of opinion in areas such as survey course content, the desirability of graduate students, and the desired amount of time spent advising students was associated with the degree to which a paradigm was believed to be developed for the particular fields.**

For the most part, their results were consistent with the hypothesis that faculty members in departments with more developed paradigms, such as chemistry and physics, exhibited a greater amount of consensus in the areas of teaching, advising and research than did the faculty in departments with less developed paradigms, such as sociology and political science. There are several reasons for this relationship, according to Lodahl and Gordon (1972). First, high paradigm fields exhibited more of a shared vocabulary, leading to a greater parsimony of communication. This was supported in the later findings of Salancik and Pfeffer (1974) and Pfeffer and Moore (1980a). In these studies, the average length of dissertations and dissertation abstracts was computed from twenty-five random dissertations and another twenty-five abstracts in each of twenty fields. Dissertations and abstracts were significantly shorter in the physical science fields as opposed to the social sciences and the humanities, thus reinforcing

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** The question Lodahl and Gordon used reads as follows:

> Scientific fields are often said to vary in the their degree of development or maturity. Whether or not you agree with all the implications of this statement, it is probably true in some scientific fields scientists are more uniform in their scientific practice than in others. This is because their field has a larger body of generally accepted theory and agreed-upon methodologies - paradigms on which to base their present investigations.
>
> Please rank the following fields on the degree to which you feel there is a consensus over paradigms (law, theory, and methodology) within the field (1=most consensus). (1972, p.59).

Lodahl and Gordon's earlier findings.

A second reason that Lodahl and Gordon offer for the relationship between high paradigm development and high consensus is that a well developed paradigm provides an "accumulation of detailed information (scientific findings) on what has been successful in the past" (1972, p.61). In other words, there is a higher level of agreement on methods, results, and conclusions. And, finally, Lodahl and Gordon put forth that structure enhances predictability, and that fields with highly developed paradigms exhibit more structure, and are therefore more predictable.

Several of the methods that have been used to determine the level of paradigm development for a particular department have been discussed above. These include the direct questioning of faculty members and the computation of the average length of dissertations and abstracts. Salancik and Pfeffer (1974) and Pfeffer and Moore (1980a, 1980b) also included what they thought to be a local measure of paradigm development: the longest sequence of prerequisite courses within each department. This was highly correlated with the other measures of paradigm development; for example, the longest chain of prerequisites had a negative correlation of .83 ($p \leq .001$) with the average length of dissertations in Pfeffer and Moore's 1980a study. This is similar to the results found in other studies mentioned above. Lodahl and Gordon (1972) also examined membership in professional societies as a possible indicator of consensus or differentiation within a field. This was not discussed extensively.

Pfeffer and Moore (1980b) and Chaffee (1980) both found that paradigm development was significantly related to both the number and amounts of grants and contracts received, and the proportional share of the budget received.

A final point about paradigm development is that in the studies cited above, an assumption was made that high paradigm development entailed there being one paradigm within the department and that low paradigm development meant that there were many small paradigms. Correlation along these lines is likely to be high; there is, however, the possibility that there are departments that would be classified as high paradigm departments even though there is a great deal of internal differentiation; an example would be a physics department that had separate course progressions for theoretical physics, as opposed to applied or experimental physics. There may be departments that contain several whole paradigms within them: in a smaller college or university an English department may contain the fields of journalism and linguistics as well as literature and creative writing. There may also be departments that could be classified as low paradigm departments that have few subparadigms and little internal differentiation: a political science department in which all members have similar political philosophies may fit into this category. More research needs to be done in this area before a real understanding of the paradigm phenomena can be developed.

CONCLUSION

The purpose of this paper was to present some characteristics of academic departments which affect the allocation of resources within institutions of higher education, especially under conditions of resource scarcity when such information is more valuable. Information on all the characteristics discussed above - student enrollment, instructional units, grants and contracts, departmental representation on faculty committees, the number of words in dissertations and abstracts, the listings of course prerequisites - can all be gathered by the administration of an institution indirectly and discreetly, especially at public institutions. All the information can be obtained from the institution's archives, financial records, and course catalogues. The two measures included in the research discussed above that cannot be obtained through a document search - department chairpersons' perceptions of which departments were powerful and which departments had highly developed paradigms - were so highly correlated with their more objective counterparts that their omission detracts only slightly (if at all) from the data.

The results and implications of these studies could be useful to administrators who are confronted with the task of institutional retrenchment. There are, however, limitations. The rationale as to why some of these relationships exist and the ethical questions as ought they exist are left unanswered. Knowing these relationships are there may assist in putting the problem of resource allocation in perspective, but it will not make the difficult decisions concerning where and how to make cutbacks any less simple or painful.

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IR and Administration

INSTITUTIONAL ACCREDITATION AS A VEHICLE FOR ESTABLISHING A SYSTEMATIC PLANNING, BUDGETING, AND EVALUATION PROCESS: A CASE STUDY

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Institutional/organizational planning and evaluation have long been identified as cornerstones in a systematic budgeting process. (Simon, 1957; Hall, 1977; Anderson, 1978) Planning models abound ranging from the classic rational model in which all alternative courses of action are evaluated in light of their cost-effectiveness with respect to stated institutional objectives (Dror, 1968; Allison, 1971; Quade, 1975), to the more incremental planning models which allow for pragmatic, political, and human limitation institutional considerations. (Simon, 1956; Lindblom, 1968; Allison, 1971) The common threads in all planning models are the need for clearly stated institutional goals; precise, measurable objectives for achieving organizational goals; and a systematic process whereby progress toward goals and objectives is regularly and routinely assessed.

Kells (1977) and Richardson (1977) argue that academic managers have historically made little use of planning processes. When such processes have been implemented, their design and execution has generally been poor. Rarely have they led to systematic, cyclical, useful evaluation of institutional programs. Kells (1980) suggests that the time is long overdue for colleges and universities to employ systematic planning and evaluation processes in charting their institutional direction. He further suggests that the self study processes associated with institutional and programmatic accreditation reviews are a useful foundation upon which to construct the planning and evaluation process. Richard M. Cyert, President of Carnegie-

Mellon University, and an established planning theoretician, recommends that academic planning be strategic in nature:

> " Strategic planning is a new development of great potential. This type of planning is not the same as the mechanical and deterministic long-range planning that was tried a decade or two ago. Strategic planning deals with a new array of factors: the changing external environment, competitive conditions, the strengths and weaknesses of the organization, and opportunities for growth. Strategic planning is an attempt to give organizations antennae to sense the changing environment. It is a management activity designed to help organizations develop a greater quality by capitalizing on the strengths they already have."
>
> (in Keller, 1983, pp. vi-vii)

The SUNY College of Technology, a relatively young institution founded in 1966, is entering a period of growth stabilization and is placing a premium on implementation of a systematic planning, budgeting, and evaluation process to ensure that desired level of stability. In implementing the planning/budgeting/evaluation process, we have decided to draw upon the Kells (1980) model using institutional self study within the context of Middle States Association of Colleges and Schools accreditation reaffirmation, and are pointing toward the Cyert (1983) definition of strategic planning.

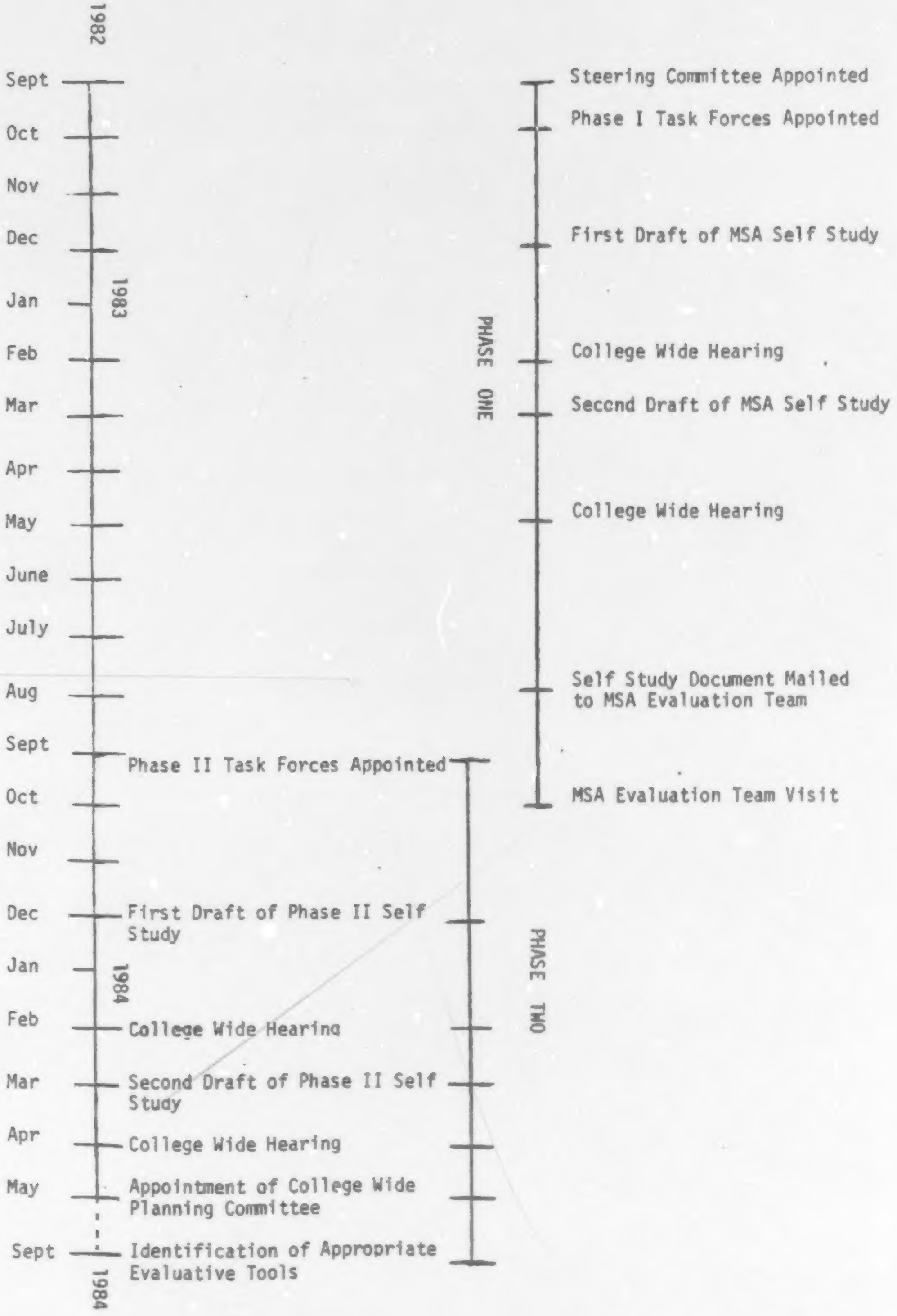
Although founded in 1966, the College of Technology, an upper division institution, did not accept its first undergraduate transfer class until 1973. The College serves bona fide associate degree holders who wish to pursue study within one of our educational mission fields, i.e., engineering technology, computer science, business and public management, and nursing. Because of its focused mission, the College of Technology is classified as a "specialized" institution within the SUNY system. We are therefore required to be a small school in terms of student enrollments, and to emphasize quality as reflected by the caliber of entering students, content of courses, research activity, community service, etc.. In light of its specialized mission, the College's planning activities must be extra sensitive to the student marketplace, industry needs, programmatic activity in competitor institutions, etc. In short, planning must be strategic.

At the same time that the College is assessing its approach to planning, two major events are occuring. The current President is completing the first year of his incumbency, having been preceeded by an individual who took the institution from birth through a period of explosive growth that was not unmarked by internal and external controversy. Thus, the College looks to the current President for a sense of consolidation of gains and overall stability. Secondly, the College is engaged in institutional self study as a preparation for Middle States Association accreditation reaffirmation. The institution has decided to seize upon these two events to invite the total campus community to re-examine itself and to collectively chart its course for the remainder of the decade. The blueprint for the new direction is the self study process.

The College has adopted a somewhat unorthodox approach to self-study. Initial Middle States accreditation was granted in 1979. At that time, the general operation of the institution received high grades, but three areas of special concern were cited: the College's approach to students with "basic skills" difficulties, the role of the faculty in academic governance, and the development of graduate programs. Implicit in the report to the College was a concern that the College had been "temporarily" quartered in a nineteenth century woolen mill since its inception and no serious movement was evident in 1979 with respect to a permanent campus. Since 1979, the College's educational mission has been focused in the fashion previously described with substantial monies committed to support instruction and research in the technologies, and ground has been broken and construction begun on a permanent campus.

Rather than duplicate the comprehensive self study that was done for Middle States in 1978, the decision was made, for re-accreditation purposes, to pursue a "special topics" approach to self study wherein the Association would be briefly updated on general institutional developments, followed by detailed discussion of how the College addressed the special concerns of the 1979 evaluation team. However, because of the interest in implementation of a strategic planning process, the steering committee that produced the accreditation self study would remain intact. Drawing upon the expertise acquired in the "special topics" self study, the steering committee would be charged with the responsibility for laying the groundwork for development of a strategic planning process. The second phase of self study, i.e., the planning-directed activity, would entail re-examination of institutional goals, assignment of responsibility for meeting institutional objectives to appropriate college offices, and identification of relevant evaluative measures for empirically assessing progress toward institutional objectives. Figure One describes the 25 month, two tiered approach to self study employed by the College of Technology.

At this writing, the College has completed Phase One of the self-study process. An evaluation team from the Middle States Association visited the campus, and the exit interview suggested that the College has successfully addressed the concerns raised in 1979 by the preceeding evaluation team. The process for Phase One self study worked much as anticipated. Task forces were assembled from lists of interested members of the campus community who voluntarily submitted their names and desired study areas to the steering committee. Each task force represented a balance among faculty, students, and administrative staff. Each of two drafts of the self study document were circulated to the total campus community, hearings were held, and revisions made in light of new information. As a result of this consultative approach to self study, the final documents which were mailed to Middle States in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Phase I Task Forces Appointed
First Draft of MSA Self Study
College Wide Hearing
Second Draft of MSA Self Study
College Wide Hearing
Self Study Document Mailed to MSA Evaluation Team
MSA Evaluation Team Visit
PHASE ONE
Phase II Task Forces Appointed
First Draft of Phase II Self Study
College Wide Hearing
Second Draft of Phase II Self Study
College Wide Hearing
Appointment of College Wide Planning Committee
Identification of Appropriate Evaluative Tools
PHASE TWO

Figure One: Complete Timeline for Phase One and Phase Two of College of Technology's Overall Self Study Process summer of 1983, were consensus documents which accurately reflected the assessment by the total campus community of institutional progress in the areas of basic skills, faculty governance, and graduate study.

As the College enters Phase Two of the self study process, the steering committee is employing the same consultative machinery to come to total campus consensus on the institution's mission and goals. Campus consensus is crucial inasmuch as these goals and objectives will become the basis for quantitative assessment of a broad spectrum of activity across the campus. Each campus goal must lend itself to the formulation of precise, measurable objectives for determination of progress toward that goal. Responsibility for achieving institutional objectives will then be assigned to appropriate campus offices and personnel. This assignment will be the product of analysis of campus activity by the task forces that have been appointed for the Phase Two institutional self analysis. Having defined the institutions goals, having established measurable objectives for achieving those goals, and having assigned responsibility for each objective to appropriate campus personnel/offices, the self study steering committee is scheduled to go out of business in mid-1984, and be replaced by a Campuswide Planning Committee appointed by the President, and charged with responsibility for overseeing the College's strategic planning process.

The authors of this paper have given considerable thought to the structure of a planning process at the College of Technology. It is our belief that the strategic planning process must be comprised of three subsystems - long-term planning, developmental planning, and operational planning. Long-term planning operates on a distant time horizon, usually five to ten years, and articulates the institutions goals as defined in Phase Two of the self study process. A campus mission statement is an appropriate framework for long-term planning. The campus mission statement describes specific goals for the College that outline where the institution wants to be five to ten years down the line. For instance, an academic goal might be to provide appropriate upper division and graduate instruction in all areas of engineering technology taught in the State's two-year colleges. An administrative goal might be to provide interactive, on-line information processing to aid campus managers in decision-making. In each instance, the goal is specific but not detailed. That is, it provides a direction for institutional movement and imposes a time constraint (i.e., 5 - 10 years) but does not specify the action steps required to achieve the goal. The latter is accomplished through developmental and operational planning, executed within the context of an overall strategic plan.

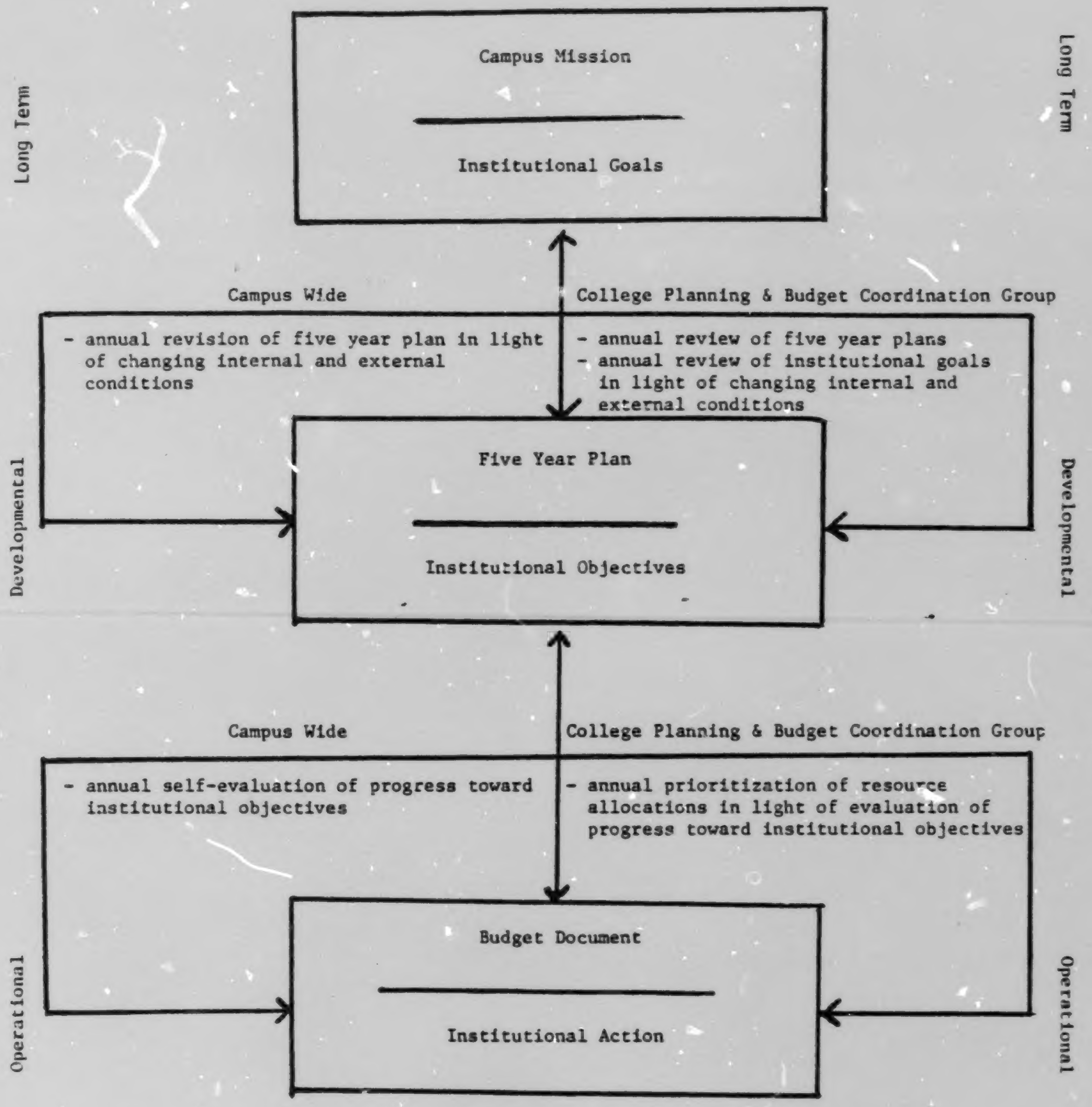
Developmental planning uses a shorter time horizon, usually three to five years, and is far more specific than long-term planning. Developmental planning charts a precise course of activity directed at attainment of clearly measurable institutional objectives, also defined in Phase Two of the self study process, which in turn are related to achieving institutional goals. Using the goal examples cited in the preceeding paragraph, academic developmental planning might be described in terms of a five-year plan for specific objectives such as stabilizing faculty and instructional FTE levels in electrical, mechanical, and industrial engineering technology, introducing masters level curricula in each discipline, while introducing a bachelor's program in civil engineering technology. Administrative developmental planning might be viewed in terms of a five year plan for such objectives as bringing the business office, personnel office, facilities office, and registrar's office, along with their respective data files, into an interactive, on-line computerized management information system. In each instance, when in final form, each objective must be cast in empirically measurable action steps with respect to essential activities, time frames, and required resources.

Developmental planning, via generation of a five year plan, is a dynamic process. Institutional objectives defined in the plan are annually reassessed to determine their continued viability in the face of changing internal and external organizational conditions. If the objectives remain viable, they can be modified as necessary (e.g., time frame extended or shortened, resource requirements restated) to accomodate changing environmental circumstances. If objectives become non-viable (e.g., insufficient resources available, inadequate progress toward attainment, etc.) they can be displaced and a new set of objectives generated. The capacity to mold institutional objectives to prevailing environmental conditions is one of the features in the developmental phase of strategic planning that makes this style of planning superior to the rigid, mechanistic, rational models of decision literature.

Operational planning coincides with the annual budget cycle and addresses short-term, one year planning activities, and the allocation of resources to specific program activities directed at attainment of one or more institutional objectives contained in the five year plan.

The mechanism by which the Campuswide Planning and Budget Coordination Committee, to be appointed in May 1984, will mesh operational and developmental planning with long term planning is yet to be worked out in detail. Generally speaking, annual resource allocations will be prioritized by the Planning and Budget Coordinating Group on the basis of progress of a given office toward achieving its objectives as stated in the five year plan. The five year plans, in turn are annually reviewed to assess their relevance to institutional goals. Finally, institutional goals are periodically reassessed to determine their continued viability in light of changing environmental conditions. Full campus participation in assessment and evaluation

Figure 2: Components of the Planning Process


Campus Mission
Institutional Goals
Long Term
Long Term
Campus Wide
College Planning & Budget Coordination Group
- annual revision of five year plan in light of changing internal and external conditions
- annual review of five year plans
- annual review of institutional goals in light of changing internal and external conditions
Five Year Plan
Institutional Objectives
Developmental
Developmental
Campus Wide
College Planning & Budget Coordination Group
- annual self-evaluation of progress toward institutional objectives
- annual prioritization of resource allocations in light of evaluation of progress toward institutional objectives
Budget Document
Institutional Action
Operational
Operational

activity will be built into the process. Figure 2 coutlines what at this time appears to be general components of our strategic planning process.

The SUNY College of Technology is committed to a course of action that will enable us to aggressively plan for the future and to be masters of our own destiny. The self study process has been an extremely useful springboard for constructing a strategic planning, budgeting, and evaluation process. The activities of the Campuswide Planning and Budgeting Coordination group, once in place, will provide an annual cycle of documentation that will facilitate future Middle States Association and professional curriculum accreditation self studies. More important, it will involve the total campus in a process directed at systematically realizing the institutional goals inherent in our educational mission.

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The Effects of Information Processing On Information Usage

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INTRODUCTION

Few outcomes associated with an Institutional Research (IR) report are as disheartening to the study originator as the state of inertia that often prevails after its release.

This type of institutional paralysis is particularly troubling to information providers like those of us in Institutional Research, since the fruits of our labors are supposed to impact either directly or indirectly on the development and evaluation of our institutions.

Unfortunately, over the years, many of us have arrived at the same conclusion reached by Stevens and Tornatzky that the impact of our data on the formulation and alteration of institutional policy is barely discernable.

Sharing this concern with several of my colleagues resulted in two suggestions concerning the reporting format that was currently used for institutional reports. One suggestion called for a more qualitative approach to information gathering and reporting. The other suggestion called for more emphasis on explicit recommendations of how report information could be put to institutional use.

A quick scan of the literature indicated that these were reasonable suggestions in light of the problem. Leviton and Hughes who accumulated research findings of factors that encourage the translation of study results into action, cite several studies that demonstrate that, depending upon the audience, the choice of qualitative or quantitative information can effect the use of information.They also cite studies in which explicit recommendations have been found to enhance the utilization of information.

In addition to these two information processing factors they have identified several other variables that fit into this category. These variables and their demonstrated effects on the use of information follow ;

- readable reports are utilized more
- clear communication of knowledge strengthens the possibility that a report will be used
- use of technical jargon decreases the likelihood of use
- the higher the level of faith that can be placed in the information, the greater the likelihood it will be put to use.
- unanticipated information or information that is surprising in light of intuition or other sources available to the reader is less likely to be used as is information that is perceived to be of low quality.

In an effort to improve readership of our IR reports, and in turn use of the information contained within, institutional information obtained from a survey of students who graduated from the College five years prior to the initiation of this study was packaged using several different formats.

One version of the report was written in the style used for previous IR reports. This format is best described as semi-technical. The information is quantitative in nature, a generous amount of tables and graphs are used throughout the presentation. The methodology of the study is detailed, including data collection and statistical procedures. Technical jargon, although kept to a minimum, is not completely eliminated.

Another version of the report was written with a more qualitative overview. Instead of aggregated, discrete measures of student outcomes as described in the previous report style, six case studies were reported using detailed description, open-ended narrative and direct quotations. This version of the report was devoid of systematic,standardized statistical procedures. Methodological description was kept to a minimum, active verbs,first person pronouns and contractions were used throughout.

Additionally, reports received by half the study participants contained recommendations for using the information while the remaing half did not have recommendations in their report. In summary four versions of the report were prepared.

1- Quantitative, semi-technical with recommendations

2- Quantitative, semi-technical without recommendations

3- Qualitative,non-technical with recommendations

4- Qualitative,non-technical without recommendations

METHODOLOGY

Participants in the study were limited to 35 College staff who ordinarily receive IR reports. Each participant received a qualitative and quantitative version of the report. The combination in which they were received varied for each individual. In addition, half received reports with specific recommendations included, half recieved reports without recommendations.

After reviewing each version of the report, the staff member was requested to complete a questionnaire that included an assessment of the report in the following areas related to information processing ; readability, clarity,methodology, reliability, relevance, parsimony, and confirmation of expectations. A five point rating scale was used for this purpose. In addition, they were requested to detail specific ways in which they would use the information.

The objectives of this study were to determine which of the 20 information processing (IP) factors were related to use of report information and if potential information users perceived differences among the four format styles with regard to the IP variables.

ANALYSIS OF RESULTS

In all, 20 staff members returned usable questionnaires that provided evaluation information for both of the reports they received. Seven additional staff members returned one of their questionnaires.

Correlation coefficients were computed in order to determine which of the IP variables were significantly related to information use. All questionnaire data were used in this phase of the analysis which produced the following significant relationships:

- the greater the overall level of interest in the report, the more likely it will be used.
- the more comprehensive the information, the more likely it will be used.
- the greater the relevance of the information, the more likely it will be used.

- the less extraneous information in the report, the more likely it will be used.

Several implications for reporting institutional information can be inferred from these results. The relationship between both level of interest and degree of relevance underscores the importance of directing appropriate information to the proper audience. Regardless of the overall qualities of the information provided to the potential user, only information that is directly relevant will receive much consideration by them.

The results also indicate that not only should the information be relevant, it should be comprehensive. Information users need information that is thorough and complete. An issue needs to be considered from all possible angles. All the necessary facts are considered important when making informed decisions.

While information users are interested in comprehensive evaluations of an issue, they are not interested in unnecessary and tiresome detail. If the important data gets lost in the middle of superfluous information, it is unlikely to be found and therefore put to use.

The test for perceived differences among the four different reporting styles was set up as a mixed-model analysis of the repeated measures design. Only questionnaires returned by staff who evaluated both of the reports were used in this analysis. Subject was treated as a random effect nested under the recommendation variable and fully crossed with the quantitative/qualitative reporting style variable.

Results of this analysis indicated that the presence of recommendations in the report did not have a significant effect on the reported level of usage of the information nor did it effect how the report was perceived by readers along any of the IP dimensions.

Significant differences in the ratings of several of the IP dimensions were associated with quantitative/qualitative reporting styles. The qualitative reports were rated more highly in the area of clear communication of information, comprehensive coverage of the research issue and accuracy of interpretation of results.

The information associated with quanitative reports, on the other hand, was rated as more reliable.

Although significant differences were found along several of the IP variables, reporting style did not significantly effect the use of information. This is not surprising since comprehensiveness of information was the only IP variable that was significant in both the correlation and repeated measures analysis.

The repeated measures analysis did not result in any significant interaction effects.

DISCUSSION

A review of the literature suggests that no single factor determines a good report. Likewise no single factor will ensure that report information will be used. Although this study did not demonstrate that information use was directly effected by reporting style, it did indicate there were several areas in which qualitative reporting style outrated quantitative style (interest level,comprehensiveness,relevance) and one area in which quantitative style was judged superior to qualitative style(reliability). Research by others has shown these areas can have an effect on utilization of information.

Based on this information, future IR reports will have a softer tone. Both quantitative and qualitative measures will be included. The format will be less cluttered with unnecessary analysis. It will be more personalized with less of a "term paper" approach. More emphasis will be placed on practical application of the information. Short summaries highlighting major findings and their implications will be circulated to general College staff. A more detailed report of the information will be shared with staff who have a more direct interest in the information.

I have received a lot of positive input from study participants and thanks for seeking their opinion.

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THE IMPACT OF LEADERSHIP ON THE PLANNING PROCESS

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INTRODUCTION

This study is an in-depth analysis of the impact of leadership and leadership styles on the planning process. It reports on four case studies, conducted over a period of fifteen years, at two major public universities. It is unique because, unlike previous studies which have dealt with the planning process in either a technical or superficial manner, it conceptualizes planning as a political process. The cases illustrate a variety of leadership types, as well as provide insight into the nature of leadership at a variety of different points in the decision making process.

BRIEF REVIEW OF THE LITERATURE

Leadership in the academic planning process is a function of the role of the planner and the way in which he/she uses his/her power. The literature offers several different versions of this role, ranging from a characterization of the planner as a manipulator to describing him/her as a resource agent or policy analyst.

The case studies, which form the substance of this research, illustrate a variety of leadership types, and portray leadership at different points in the decision making process. At one time, it may be the chair of the planning committee whose leadership or lack thereof is crucial. At another time, it is the vice-president or the president whose leadership may make the difference.

One school of thought portrays the planner as a behind the scenes manipulator formulating plans with only minimal input from, and almost no active involvement with, others (Temkin, 1972). This approach conceptualizes planning as a technical task rather than as an interactive political process. If this model has any value, it is only in possible application in hierarchical and predictable organizations where there is little need for consultation and widespread participation. Planning and implementation are accomplished primarily through the use of downward communication from an information/power center located at the top. This model is inappropriate to a university setting characterized by diffuse power.

The second conceptualization of the role of the planner is that of resource agent for the decisionmaker (Choi and Lyons). This version depicts the planner as having no independent power, and very little prospect for even derivative power from the decisionmaker. This approach assumes an environment in which information is freely available, an unlikely assumption in most organizations. Even when the planner is defined as staff to the decision-maker, he/she must have enough power and status to develop a fairly equal relationship with the persons he/she needs to work with on a continuing basis.

A unique approach to the role of the planner is that of the partisan policy analyst (Swanson, 1974). This approach, as defined in the literature, encompasses several of the initial steps in the planning process. First, to assist the partisans in clarifying their own policy preferences, second, to seek linkages between alternative policies and outcomes which can become the basis for persuasion and coalition building; third, to simplify and pinpoint the issues which must be debated; and finally, to clarify points at which compromise is necessary.

The concept of the partisan policy analyst is useful for thinking about the role of the planner in the university environment, because it provides a mechanism for integrating an explicit recognition of goals and value positions into the political process. This recognition is a critical element in attempting to bridge the gap between planning and implementation.

In examining the role of the planner and leadership in the planning process, it is useful to consider the nature of the organization. Most writers on this topic have described the university as an organization characterized by diffuse power and decentralized decisionmaking. This model assumes a general sharing of values and outlook throughout the organization and a relatively free flow of information laterally as well as downward so that functions are not precisely defined. Decision making is, in most cases, delegated to the lowest point in the organizational hierarchy where it is still possible to coordinate and control activities which result from the decision.

This conceptualization of the organization of the University has been prevalent in the literature for some time. It is interesting to note that the recent trend in organizational theory has been to describe a variety of organizations, including private business, in terms more closely approximating the university and less in terms of the old bureaucratic and hierarchical models. These organizational models assume high levels of professionalism, a highly educated work force, and leadership which is stimulative and collaborative rather than directive (Mosher, 1971).

In these models, work is structured around projects or problems rather than hierarchically. The professional in such an organization is oriented to problems and projects rather than the organization. Professional status and the capacity for problem solving are as important, or more important, than one's position in a hierarchy. However, not every professional is capable of operating in such an environment. Some lack the ability to work in situations where there is uncertainty and ambiguity and on problems for which there is no correct solution. Also, even among professionals, there can still be discouragement of creativity, experimentation, innovation and initiative.

In order to counteract these tendencies and provide effective leadership in such an environment, management must recognize several fundamental changes (Bennis, 1966).

1. A new concept of *man*, based on increased knowledge of his complex and shifting needs, which replaces the over-simplified, innocent pushbutton idea of man.
2. A new concept of *power*, based on collaboration and reason, which replaces a model of power based on coercion and fear.
3. A new concept of *organizational values*, based on humanistic-democratic ideas, which replaces the depersonalized mechanistic value system of bureaucracy.

If one does not accept the concepts of "adhocracy" or a university as a collegium, questions surrounding the nature of leadership still remain. Even in a hierarchy, power and authority are not always as simple as they might seem. This point is well illustrated by Richard E. Neustadt in his book on *Presidential Power*, (1960). He describes the "classic problem of the man on top in any political system; how to be on top in fact, as well as name".

Neustadt states that the search for personal influence is at the center of leadership. In his analysis of the presidency, it is quite clear, that despite the formal powers of the presidency and his roles as "Chief

Legislator", or "Chief Administrator" etc. power is not an automatic fringe benefit of the job. The lessons to be learned in this analysis of the presidency are useful in analyzing leadership in a variety of organizations.

In three cases, Truman's recall of Douglas MacArthur, Truman's seizure of the steel mills and the 1957 Eisenhower order of Federal troops into Little Rock, Neustadt describes situations where, at least superficially, the president used his power effectively and produced results. However, the in-depth analysis of the three cases illustrates the special circumstances favoring command.

In all three cases, Neustadt describes five common factors which lay behind the ready execution of these orders.

1. The president's involvement was unambiguous.
2. His words were unambiguous.
3. His order was widely publicized.
4. The people who received it had control of everything needed to carry it out.
5. They had no apparent doubt of his authority to issue the order.

Regardless of the organizational model to which one ascribes, it is clear that leadership in a university is not as simple as issuing an order and having it carried out. Leaders must have considerable persuasive powers and they must be able to function in an environment in which specialists, i.e. faculty, can make legitimate claims to having superior expertise in some areas. Decentralized decision-making puts special burdens on leadership, particularly in the planning process.

DEFINITIONS

The focus of this study was on comprehensive institutional academic planning. Comprehensive, in the sense of examining the way an institution integrates its various subunits. Planning as it occurs in the individual sub-units is not without its importance, but, for purpose of this study, was dealt with only as it related to overall planning. Institutional, as opposed to state-wide or multicampus approaches, although the interface between the institution and the larger entity to which it belonged could not be totally ignored. Academic, in the broad sense of dealing with policy questions and resource allocation, but with physical planning only tangentially, as it impacted upon academic decisions.

There are almost as many definitions of planning as there are writers addressing the topic. Although there is a great deal of overlap and duplication, two viewpoints on planning emerge. The first, offered largely, though not exclusively, by writers of the late 60's and very early 70's and by writers with a business orientation, is essentially product oriented. This conception of planning focused on how to arrive at and what to do with a "plan". (Drucker, 1964).

Later writers and those writing with specific application to higher education modified this concept by focusing on the planning process (Banghart and Trull, 1973 and Halstead, 1974). As practice indicated that careful planning did not necessarily result in implementation, particular attention was paid to the development of criteria for evaluating planning effectiveness over time (Glenny and Weathersby, 1971).

This case study is interested in both of these dimensions of planning. The development of a final plan is important as the end product of the process, and as the mechanism against which to measure progress. However, the process itself, including the development and the implementation of the plan, is integral to the entire process.

The following are the operational definitions of these two dimensions of planning as used in this study.

Dimension I, the product dimension, was primarily concerned with whether a plan was produced and implemented. The criteria which were used in evaluating a planning effort along this dimension included: were the goals clearly determined, the problems diagnosed, the options thoroughly examined, the possible solutions selected, and a plan of action determined? Although the focus along this dimension was primarily with the product, the mere writing of the plan was not sufficient to indicate success. The plan must have been, to some extent, successfully related to the ongoing life of the institution. However, there was no attempt to evaluate the long term outcomes of the changes instituted.

Dimension II focused on the process. A planning process was evaluated along Dimension II by ascertaining its value to the institution. The criteria used included: Did the process serve to educate the university community to the existing possibilities and constraints? Did it foster an acceptance of the concept of planning in general and of this process in particular?

ANALYSIS

Case I - Shortly after the appointment of a new president at the first institution under study, a Vice President for Academic Affairs was recruited with a specific mandate to produce an academic plan.

The process undertaken was in the form of a draft personally developed by the Vice President of Academic Affairs. It was soundly rejected by the Deans, who in turn set about to develop their own plan. However, after several drafts, they were unable to reach any agreement. At this point the Faculty Senate, frustrated at being left out of the process, became involved. This body labored for well over a year and produced an official document. However, it was vague and had no impact on the University community.

The consensus of the interviewees was that leadership in this case was inadequate. The Vice President's personal style, concept of administrative responsibility and view of the University worked against his being able to function as an effective leader. Responsibility for planning was not clearly fixed, and the university culture encouraged virtually everyone to consider themselves primarily responsible for planning.

The University made no progress along either the product dimension or the process dimension during this time. At the end of this period, the Vice President had severely strained relationships with the Deans, the faculty and the President, resulting in his resignation. The University community was torn by differing opinions on the nature of academic planning, the appropriate rules for the different constituent groups, and even on what constituted a proper time-frame. The period ended not only without producing a plan, but with significant costs incurred by the breakdown of the planning process.

Case II - Despite the disastrous situation described above, the President was determined to develop a plan. In an effort to avoid the earlier mistakes, the President decided to retain control over this process himself, at least at the beginning.

The mechanism the President selected was to appoint a "blue-ribbon" committee of faculty, with faculty members as co-chairs. This Committee was appointed by the President, and was to be advisory to him. The Committee undertook an ambitious and extensive study of the University. They ultimately produced two documents, an interim report, which aroused great controversy on campus, and a final report.

This case was characterized by ambivalent Presidential leadership. Initially, the President emphasized the personal nature of the process--he appointed the Committee, and it was to report directly to him. However, during the year of deliberations, he maintained a careful distance, meeting with the Committee only once, at their request. When the Committee issued their initial report, he released it without comment to the University community for discussion. Although this action was undoubtedly taken in order to avoid the criticism of lack of participation leveled at previous planning efforts, it was interpreted as lack of confidence on the part of the President toward the work of the Committee. The report was soundly criticized from all quarters.

Both the participants in the process and interested observers were confused as to who had responsibility for providing leadership in the process. Although the co-chairs exhibited strong leadership within the Committee structure, this was insufficient when the report entered the University arena. Presidential leadership, never clearly defined, lapsed when the Interim Report became controversial on campus.

Although this process produced a plan, there was widespread agreement that no recommendations of the plan were implemented. On the process dimension, this planning effort received mixed evaluations. Interviewees pointed out that the process had educated people to the reality of limited resources, created a cadre of persons knowledgeable about the University, and served as a basis for future plans. However, the costs of another failed effort at planning, in terms of the perceived credibility of future planning efforts were high.

Case III - The third planning effort at this same institution was initiated upon the appointment of a permanent Vice President for Academic Affairs. Prior to his appointment, this Vice President, like his predecessor several years earlier, was assigned the task of developing an academic plan.

This Vice President however, immediately took two crucial steps. First, he established himself as the focal point of responsibility for planning leadership. His personal involvement was unambigious. In fact, the entire planning process was known by his name. Second, he made it known that this was to be an open process. He encouraged academic departments to develop initial plans and appointed a small number of task forces to advise him in selected areas. He also evaluated previous plans. Initial draft planning documents were widely circulated on campus and adapted accordingly. The open stimulative process made it virtually impossible for any faculty or staff to be unaware of what was occurring.

This planner was able to control the development of the product, while still allowing a process which was collaborative and reserving to himself the responsibility to make judgements. He also recognized and used the expertise and interests of others. Futhermore, the plan was written in a language which the Vice President could control through his budget power. There was no ambiguity in this authority.

This effort resulted in a product which had fairly wide consensus on campus, and was the only plan developed during this time which was at least technically capable of implementation. Unfortunately, implementation was terminated when the Vice President left the University for another position. This occurance emphasizes the costs of over-personalization.

On the process dimension, this episode was judged beneficial to the University. The institution had completed a major planning effort without incurring trauma.

Case IV - The final planning effort to be examined took place at a major multi-campus institution. This institution had previously attempted numerous approaches to planning but had been repeatedly unsuccessful and was characterized by a high cost of failure.

Early in the most recent stage of the planning process, it was decided that most of the "grassroots" work had been done during the previous stages. What was needed was a unifying theme, to provide an over-all sense of direction which would highlight coordinated planning and a sense that each campus was embarking on parallel futures.

Therefore, a "top down" process was selected. The University President had his staff write a university-wide section, outlining major priorities and strategies. At the campus level, the Chancellors and their staffs recast existing planning documents to parallel the university-section.

In this case, as in Case III, after years of floundering and effort which was not readily productive, it was finally personal leadership which made the difference. The President recognized the contributions of the various constituencies and encouraged a variety of inputs over several years; however, in the final analysis he was willing to assume responsibility for planning.

The formal existence of a plan approved by the Board of Trustees testifies to success on the product dimension.

Evaluation on the process dimension in this case will be tied closely to the implementation. In this case it is still too early to report. However, due to the personal nature of the leadership, it would not be suprising if implementation stalls if the President is, for any reason, removed from the scene.

CONCLUSIONS

The conclusions drawn from this study are limited by the small sample necessitated by case study methodology. However, the following summary of findings may be of use to institutions designing a planning process. In Case I, the leadership was considered inadequate, and the university made no progress along either the product dimension or the process dimension. The period ended not only without producing a plan, but with significant costs incurred by the breakdown of the planning process. Case II was characterized by ambivalent presidential leadership which lapsed when the report became controversial. Evaluated along the product dimension, this effort was not successful. Although a plan was written, no recommendations were implemented. On the process dimension, there were mixed evaluations--although some learning took place, the costs of another failed effort in terms of the perceived credibility of future planning were high.

In Case III, the leadership was unambiguous, stimulative and collaborative. This led to an evaluation of a high level of success on the process dimension. On the product dimension, a plan was written which was technically capable of implementation. However, the effects of the personalization of the process were felt when the VPAA left the university and implementation stalled.

In Case IV, it was the pure force of personal leadership which produced the plan after extensive previous efforts. The results of the implementation process are not yet available.

In all cases, leadership, or lack thereof, was an important contributing factor of success along both dimensions. However, in the two cases where success was clearly related to personal leadership, there was a concurrent danger to implementation of over personalization.

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SUPPORTING INSTITUTIONAL DECISION MAKING: THE ROLE OF INSTITUTIONAL RESEARCH

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Office of Institutional Research
State University of New York at Binghamton

Every institutional research office supports institutional decision making in some way. Some offices view this to be more central to their role than others. Of course roles are not unilaterally defined. An institutional research office's role results from both the office's interest and the senior administration's style and interests. This paper will describe the decision support function of the Office of Institutional Research at SUNY-Binghamton.

SETTING

SUNY-Binghamton is one of the four doctoral granting university centers of the SUNY system. It offers the PhD in 14 programs and enrolls nearly 12,000 students in majors offered by schools and colleges of Arts and Sciences (Harpur College), Engineering, Management, Nursing, and General Studies and Professional Education. The institution is highly selective and seeks to maintain balanced growth and continued quality in a dynamic environment dominated by a large and complex bureaucracy. This setting demands information capacities of considerable quality. The environment and organizational culture invite an active institutional research office involved in the highest levels of decision making.

THE OFFICE

Binghamton's Office of Institutional Research includes 3.5 professionals, a half-time secretary (temporary reduction due to state budget shortfalls), a graduate assistant, and a work-study student. The Office reports to the Vice President for Academic Affairs through the Associate Vice President. Computing resources include a printer-terminal running APL, an IBM 3278 terminal dedicated to the student data base, and a general access terminal capable of a wide range of applications. The office hopes to obtain a microcomputer in the near future. Though hobbled by the need to prepare over 75 annual reports for SUNY-Central, the office has adequate resources to meet the demands on it.

PHILOSOPHY

It is easy, in the SUNY System, for an institutional research office to become a simple data base management and reporting office. This narrow focus helps the institution by assuring quality data, readily available and accurately reported. We have worked hard to provide good reporting without becoming its slave. In moving beyond the reporting mode the Office focuses on information with proven usefulness for institutional decision makers. This has typically fallen into two broad categories:

- HISTORIES - snapshots and trend data
- PROJECTIONS - short and long run

In doing this basic and traditional work, the Office lives by a key unspoken rule, ANSWER THE QUESTION ASKED. Reports and data which are not requested nor expected typically have little impact. Recently one office spent an entire year on a detailed retention study. It was interesting but no one had requested the data, let alone the study. It disappeared with hardly a comment.

Whether providing expected/scheduled reports or completing special/ad hoc studies, we have also learned it is best to write to the immediate audience. For example, we know that two types of information tend to be ignored: survey data and highly complex statistics. We find it a poor investment to report these types of data even if they are best for analytical purposes. Or worse it will aggravate senior officials, a situation which, if continued unchecked, can cause the institutional research office to be labeled unresponsive or irrelevant.

In sum, our Office tries to be pragmatic in its choice of activities, methodologies and data. The Office would rather work at a more applied level and have an impact than be a basic research unit and be ignored.
This choice, of course, reflects the local environment.

DECISION SUPPORT

The Office's decision support efforts respond to the philosophy discussed above. One additional component is being added, policy analysis, wherein the focus moves from a set of facts to the actions the institution may take or not take. One could diagram it as follows:

	REPORTING	DECISION SUPPORT
HISTORIES & TRENDS		
PROJECTIONS		
POLICY ANALYSIS		

What is the key difference between reporting and decision support? Reporting, although critical, is the mechanical forwarding of information. Decision support is the scheduled or requested presentation of information relevant to questions currently facing the institution, i.e., answering questions which are being asked. That information can be in the form of histories, trends, projections, or policy analysis.

Also, Institutional Research Offices gain little by adding issues to the institution's agenda. Senior officials have enough concerns without a subordinate office busily trying to open new Pandora's boxes. Agenda loading is a good way to get thrown out of the decision making system. (Being verbose, complex and technical is the best way to have access to senior officials sharply reduced.) It is only the rare and compelling new issue that an office can or should introduce. This issue must be backed by absolutely solid data. In our working environment it is poor strategy to use the senior administration as a sounding board for a "potentially interesting new data tidbit that just might open the door to a whole new set of problems." Institutional researchers have an obligation to be political realists, not narrow-minded data crunchers.

Thus in doing decision support work we adhere to certain working guidelines, which although not ideal from a textbook approach to organizational research, constitute a reality which must be respected. These guidelines include the following:

- FOCUS ON THE QUESTIONS THAT HAVE BEEN ASKED
- TAILOR YOUR PRESENTATION TO THE AUDIENCE
- STAY AWAY FROM UNPOPULAR STATISTICAL FORMATS

- KEEP IT BRIEF
- USE CHARTS INSTEAD OF WORDS WHEN POSSIBLE
- GET IT DONE ON TIME
- DON'T INVOLVE SENIOR OFFICIALS IN SPECULATION
- LET THE SENIOR OFFICIALS SET THE POLICY AGENDA.

The sections which follow describe three products exemplifying the guidelines noted above. More than anything else they focus on questions we know are important to the senior administration and they are presented in a manner which has proven acceptable. At the same time these items are so clear and understandable that they perform a generic function of supporting other decisions involving these focal variables.

WORKLOAD AND ENROLLMENT SIMULATION SYSTEM

This projection model has been used successfully for eight years - from a total enrollment of 9,000 in 1974 to the current enrollment of nearly 12,000. It was designed to provide estimates of enrollment headcounts and FTE workload for the various schools within SUNY-Binghamton. Using a given base (current or projected headcount by school and level), historical retention rates, and headcount-to-FTE conversion factors, enrollment and workload can be projected for each school for various admissions patterns or policies for fall and/or spring semesters.

The model is run as often as needed to complete the following short term or long-run objectives:

1) Establish budgeted admissions, headcount and FTE goals by school and for the total campus;
2) Assess the impact of new student input goals for fall and spring semesters;
3) Estimate tuition revenues;
4) Facilities needs and related capital budget requests;
5) Identify areas for review of faculty resources;
6) Long range planning.

In addition, the use of a computerized, interactive APL model provides fast turn-around to show the impact of a variety of "what if" questions (e.g. establish a new school, limit inputs of a school to upper division transfers, or constant inputs over time.)

Even though the model generates the final headcount and FTE workload from the individual cells of a 2x2x8x10 cell matric (UG/GR; FT/PT; 8 schools; 10 levels), it can, by trial and error, be used to establish inputs required to manage to a pre-established goal.

Since SUNY-Binghamton serves a wide geographic area and receives more than six applications for every undergraduate admissions opening, the model is not related to the available pool based on high school graduates, age or geographic origin. These elements are factored in through the realistic expectations for new students. The process requires that the Institutional Researcher work closely with appropriate knowledgeable administrators on the campus.

The working committee includes expertise in the following areas:

- Undergraduate admissions
- Graduate admissions and anticipated total headcount by graduate school
- Available or anticipated faculty resources
- Student services (e.g. available dormitory spaces)

Individual Deans have the opportunity to review the resulting projections for approval of inputs, total headcount and workload for the school. President's staff approves the final headcount and FTE workload if they are to be used for external budgeting or planning.

As in all modeling, the Institutional Researcher must critically review the results for unusual or unrealistic outcomes and, if necessary, make adjustments in the percent return, number of new students or the average workload for a given segment of the population.

The model requires an accurate data base of headcounts by undergraduate/graduate, full/part time and school by 10 undergraduate levels (1st semester freshmen through 2nd semester seniors, plus lower and upper division non-matriculated students) and masters, doctoral and non-matriculated graduate students.

The model is relatively simple, but very responsive to the inputs.

Previous Semester Headcount	X	Percent Return Ratios	+	New Admissions	=	Projected Headcount
Spring		Spring to Fall		Fall		Fall

The Previous Semester or base can be any known or projected semester. The base is multiplied by a matrix of the same size containing the percent return ratios which represent a three year weighted average of retention for each cell. The undergraduate full-time is based on a 'cascade' (e.g. percent of level 1 students in the spring who return at level 2 in the fall) while the undergraduate part-time and graduate full and part time are calculated at the same level for the following semester. These ratios are calculated for fall-to spring and spring-to-fall and are based on the assumption that the same percentage of students are going from full to part time and vice-versa; the same percentage are transferring between schools or are re-admitted; and, the same percentage of new students are admitted each summer for the spring-to-fall calculation.

A matrix of new admissions (also arrayed by school, full or part-time and level) is added, resulting in the projected headcount for the following semester. This projected headcount can now become the base and the model rerun with the appropriate fall or spring return ratios and new students.

To go from projected headcount to FTE takes an additional step. A semester's projected headcount is multiplied by the appropriate headcount-to-FTE ratio (a five dimensional APL matrix with the dimensions of 8x2x2x4x33).

8 (Schools of Students)
2 (Undergraduate/Graduate Status)
2 (Full/Part-Time Status)
4 (Levels of Student)
33 (Four levels of instruction within eight schools plus Physical Education)

This produces the anticipated FTE workload by school by level. The Fall FTE plus the Spring FTE can be added and divided by 2 in the usual manner to produce the Annual Average FTE workload.

The outcome can vary based on meeting or exceeding admissions goals, economic conditions that encourage or discourage returning students, tuition changes and other elements that can affect student retention. The model is highly reliable, not always within cells, but overall it is accurate and useful for each of the objectives. The senior administration has come to rely upon it for all enrollment planning and related activities.

ANNUALIZED ACADEMIC WORKLOAD/RESOURCE PROFILE (AAWRP)

The Annualized Academic Workload/Resource Profile, affectionately referred to by some as "the University according to AAWRP," has been an annual publication of the Office of Institutional Research since 1972. It is produced after the close of each academic year and provides, in a single, quick-reference document, frequently requested basic statistical data. University and departmental administrators rely on it for budget preparation, trend analysis, departmental evaluation and planning, and comparative analyses across departments, divisions and schools. Although published for internal use, all the information included is derived from official reported data. Therefore, it can be used to prepare documents for outside evaluators and to complete internal and external questionnaires.

The booklet contains a two-page display of five-years of data for each department, division and school and for the University. (See included sample pages.) While this is indeed the "complex statistical format" which we prefer to avoid, in this case the format reflects the Profile's purpose as a handy central reference for frequently requested data and statistical information. Also included is a glossary which contains a detailed explanation of each data item and identifies the administrative office responsible for the data. The glossary helps to avoid user misinterpretation of data and/or desperate phone calls.

The original document is computer-produced each year from a file created by Institutional Research using its own reports, files, and material solicited from other administrative offices. A Profile computer record now exists for each department for each academic year since 1972-1973. Data items for each two-page display are separated into seven categories:

Section A - State Resources

A breakdown of resources according to faculty and support FTE's, salaries, instruction and departmental research support and computer support.

Section B - Other Characteristics

Number of tenure commitments, non-tenured faculty, TA and Ga headcount and affirmative action data.

Section C - Outside Support

Number of faculty with grants, proposals submitted, proposals funded, grant expenditures, graduate student outside support funds and number of graduate students supported.

Section D - Degrees/Certificates

Granted in each of the academic years.

Section E - Student Headcount

A breakdown of undergraduate majors and beginning and advanced graduate majors.

Section F - FTE Students

A breakdown according to lower and upper division undergraduate and beginning and advanced graduate FTE's.

Section G - Workload/Cost Analysis

A breakdown of number and types of courses and sections and ratios derived from data in this section and the other sections.

Notes: Data for Sections F and G are displayed in two ways: Figures in Part I are based on all courses given by; the department; figures in Part II are based on all courses taught by faculty budgeted to the department. Also, all figures for Sections F and G are annual average, that is, fall semester plus spring semester divided by two.

Over the years, both academic and non-academic administrators have come to rely on the Profile as an essential and consistent reference tool. So much

PRODUCT: WP003

STATE UNIVERSITY OF NEW YORK AT BINGHAMTON
ANNUALIZED SCHOOL OR DEPARTMENTAL WORKLOAD/RESOURCE PROFILE

PAGE:
DATE:

SCHOOL/DEPARTMENT :

		1977-1978	1978-1979	1979-1980	1980-1981	1981-1982
SECTION A - STATE RESOURCES						
A- 1. FTEFAC LINES ALLOCATED (EXCLUDES A- 4)		27.14	27.95	28.75	28.25	27.97
A- 2. FTEFAC LINES FILLED (EXCLUDES A- 4)		27.14	27.95	28.75	28.25	27.97
A- 3. FTEFAC TEACHING ASSISTANT LINES FILLED		2.25	2.5	2.5	2.5	2.5
A- 4. FTEFAC SPECIAL PROVOST TEACHING ASST LINES FILLED		1.75	1.5	2.5	2.5	2.75
A- 5. SUPPORT FTE		16.65	16.15	15.95	15.95	15.75
A- 6. GRADUATE ASSISTANT FTE		1.25	1.75	1.75	2	2.125
A- 7. FACULTY SALARIES	$	573,335	609,750	672,989	685,633	730,001
A- 8. TEACHING ASSISTANT SALARIES	$	27,000	29,935	34,500	36,000	40,000
A- 9. TEMPORARY SERVICE - INSTRUCTIONAL						
A-10. SPECIAL PROVOST TEACHING ASSISTANT SALARIES	$	21,000	18,925	34,352	36,000	44,000
A-11. SPECIAL PROVOST ALLOCATION: T A	$	5,600	4,100	6,985	8,000	8,400
A-12. SUPPORT SALARIES	$	194,123	200,674	212,162	223,345	235,581
A-13. GRADUATE ASSISTANT SALARIES	$	15,000	23,300	25,200	30,000	35,180
A-14. SPECIAL PROVOST ALLOCATION: G A	$	1,750	500	1,400	2,000	2,000
A-15. ADDITIONAL SUPPORT	$	125,875	104,340	106,738	98,487	92,511
A-16. ADMINISTRATIVE SUPPORT	$	43,086	40,492	44,210	56,755	61,347
A-17. SPECIAL ALLOCATIONS AND TEMPORARY SERVICE	$	1,129	55,561	14,543	12,213	65,522
A-18. TOTAL DEPARTMENTAL SUPPORT	$	1,007,898	1,087,577	1,153,079	1,188,433	1,314,542
A-19. COMPUTER SUPPORT	$	1,907	1,437	4,727	7,311	7,940
A-20. TOTAL DEPARTMENTAL SUPPORT WITH COMPUTER	$	1,009,805	1,089,014	1,157,806	1,195,744	1,322,482
A-21. STATE FELLOWSHIP FUNDS	$	3,000	3,100			
SECTION B - OTHER CHARACTERISTICS						
B- 1. TENURE COMMITMENT HEADCOUNT		16	15	15	16	17
B- 2. NON-TENURED FACULTY (FULL-TIME) HEADCOUNT		10	11	12	10	9
B- 3. AFFIRMATIVE ACTION FACULTY HEADCOUNT		4	4	4	4	3
B- 4. AFFIRMATIVE ACTION GRADUATE STUDENTS		25.5	25	26.5	20	19
B- 5. TEACHING ASSISTANT HEADCOUNT		9	10	10	10	10
B- 6. SPECIAL PROVOST TEACHING ASSISTANT HEADCOUNT		7	6	10	10	11
B- 7. GRADUATE ASSISTANT HEADCOUNT		5	7	7	8	8.5
B- 8. GRADUATE STUDENT STATE-SUPPORTED FELLOWSHIPS		1	1			
SECTION C - OUTSIDE SUPPORT						
C- 1. PROPOSALS SUBMITTED		29	18	25	28	24
C- 2. PROJECTS FUNDED		17	24	32	26	24
C- 3. PERSONNEL WITH OUTSIDE GRANTS		11	13	14	16	15
C- 4. GRANT EXPENDITURES	$	352,462	413,718	424,528	538,431	529,090
C- 5. GRADUATE STUDENTS - DIRECT SUPPORT		1				
C- 6. GRADUATE STUDENT DIRECT SUPPORT FUNDS	$	5,000				
C- 7. GRADUATE STUDENTS - RESEARCH FOUNDATION SUPPORT		9.5	10.5	10.5	13	11.5
C- 8. GRADUATE STUD RESEARCH FOUNDATION SUPPORT FUNDS	$	29,078	36,595	40,923	52,796	50,635
C- 9. GRADUATE STUDENTS - OTHER SUPPORT			.5	1		2
C-10. GRADUATE STUDENT - OTHER SUPPORT FUNDS	$		3,988	2,567		9,420
SECTION D - DEPARTMENT/SCHOOL HEADCOUNT						
D- 1. UNDERGRADUATE MAJORS		426	387	403	391	387
D- 2. UNDERGRADUATE MAJORS--PRORATED FOR DOUBLE MAJORS		403	364	373	359	358
D- 3. UNDERGRADUATE UNDECLARED MAJORS						
D- 4. UNDERGRADUATE NON-MATRICULANTS						
D- 5. TOTAL UNDERGRADUATE STUDENTS		403	364	373	359	358
D- 6. GRADUATE MAJORS		64	59	65	63	63
D- 7. GRADUATE MAJORS--PRORATED FOR DOUBLE MAJORS		64	59	64	63	62
D- 8. GRADUATE NON-MATRICULANTS						
D- 9. TOTAL GRADUATE STUDENTS		64	59	64	63	62
D-10. TOTAL STUDENTS		467	423	437	422	420

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SCHOOL/DEPARTMENT :

PAGE:
DATE:

SECTION E - DEGREES/CERTIFICATES GRANTED	1977-1978	1978-1979	1979-1980	1980-1981	1981-1982
E- 1. BA	92	78	102	66	74
E- 2. BS	67	82	82	89	99
E- 3. BT					
E- 4. TOTAL BACHELOR'S	159	160	184	155	173
E- 5. MA	8	8	2	14	8
E- 6. MM					
E- 7. MS					
E- 8. MBA					
E- 9. MAT					
E-10. MST					
E-11. MSED					
E-12. TOTAL MASTER'S	8	8	2	14	8
E-13. PHD	3	5	5	5	3
E-14. CERTIFICATE					

	I. BY DEPARTMENT OF COURSE					II. BY DEPARTMENT OF INSTRUCTOR				
	1977-8	1978-9	1979-0	1980-1	1981-2	1977-8	1978-9	1979-0	1980-1	1981-2
SECTION F - FTE STUDENTS										
F- 1. LOWER DIVISION	289	269	266	233	227	304	289	285	258	227
F- 2. UPPER DIVISION	137	143	146	198	193	144	158	159	209	188
F- 3. TOTAL UNDERGRADUATE	426	412	412	431	420	448	447	444	467	415
F- 4. MASTER'S	25	20	26	24	24	24	20	26	23	23
F- 5. DOCTORAL	39	41	38	40	44	39	41	38	40	44
F- 6. TOTAL GRADUATE	64	61	64	64	68	63	61	64	63	67
F- 7. TOTAL	490	473	476	495	488	511	508	508	530	482
F- 8. WEIGHTED TOTAL	580	564	566	593	591	601	600	600	628	584
SECTION G - WORKLOAD/COST ANALYSIS										
G- 1. UNIQUE COURSES	45	43	43	47	51					
G- 2. NON-IND STUDY PRIME SEC	51	36	32	38	37	50	39	35	40	37
G- 3. NON-IND STUDY SUB-SEC	75	68	78	80	66	[illegible]	72	79	82	69
G- 4. THESES/DISSERTATIONS	32	30	32	33	34	31	29	31	32	33
G- 5. OTHER INDEPENDENT STUDY	82	119	147	130	197	[illegible]	160	184	174	199
G- 6. NON-IND STUDY SEC /FTEFAC	4.4	3.5	3.5	3.8	3.4	4.3	3.8	3.6	4	3.5
G- 7. THESES/DISS/FTEFAC	1.1	1	1	1.1	1.1	1.1	1	1	1	1.1
G- 8. OTHER IND STUDY/FTEFAC	2.8	4	4.7	4.2	6.4	3.9	5.4	5.9	5.7	6.5
G- 9. WFCOH EX IND ST /FTEFAC	11.8	8.6	10.5	10.5	9.3	11.5	9.7	10.7	10.9	9.4
G-10. WFCOH IN IND ST /FTEFAC	16	14.5	16.1	16.2	16.7	16.5	16.3	17.1	17.5	16.8
G-11. STUDENT/FACULTY RATIO	17	16.1	15.2	16.1	15.9	17.7	17.2	16.3	17.2	15.7
G-12. WTD STUDENT/FACULTY RATIO	20.1	19.1	18.1	19.3	19.2	20.8	20.4	19.2	20.4	19
G-13. I & DR COST/FTESTU	$ 2,061	2,302	2,432	2,416	2,710	1,976	2,144	2,279	2,256	2,744
G-14. I & DR COST/WTD FTESTU	$ 1,740	1,932	2,044	2,017	2,237	1,679	1,814	1,930	1,903	2,264
G-15. AV CLASS SIZE EX IND STUDY										

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so, in fact, that any delay in publication brings more than a few anxious calls to Institutional Research. Of course, some of the information can be obtained in bits and pieces from the other contributing offices, but it all comes together only in the Profile where explanations are complete and definitions consistent. The document has wide acceptance because definitions are agreed upon, data are always accurate, and the information is relevant to the daily concerns of administrators. Senior administration views this document as an important device for establishing a common data base for all administrative offices.

FACULTY/TENURE PROJECTION MODEL

There are two primary reasons why faculty/tenure planning is important at the University Center at Binghamton -- maintenance of tenure as a symbol of achievement, and assessment of faculty status. Faced with rigid external control over fiscal matters in a highly unionized environment, tenure is one of the remaining ways to reward superior achievement. The tenure proceedings are instrumental in comparing performance with University expectations. Its award is a vote of confidence which contributes to the maintenance and enhancement of academic quality and freedom. Consequently, we are concerned with tenure level and how it relates to resource flexibility.

Secondly, tenure planning flows into the larger issue, faculty planning. It allows decision makers to more clearly understand their personnel position historically and how it might change in the future. Faculty rank, flow, and attrition levels are key components in assessing: the viability of reallocating positions from low demand to high demand areas, the effects of the current tenure policies, and the possible consequences of current faculty hiring activity. This process can clarify institutional requirements and their alternatives in view of a longitudinal faculty resource picture.

Faculty projections, as with resource projections in general, lose two qualities as the projection period is lengthened: accuracy and audience. Resource projections lose accuracy regardless of the method or content area. Projections are made within different environments under which the projected will occur. Accuracy diminishes as environments change. Simultaneously, decision makers who are the consumers of projections find the immediacy of their need decreasing the farther the projection is extended. At many institutions decision maker interest beyond the next budget cycle is limited.

Consequently, longer projections are evaluated on the merits of their political value rather than resource implications. In one sense, medium to long range projections are done more for the drama of their implications than for their numerical content. Fortunately, Binghamton has a prudently conceived five year plan securely linked to budget cycles. The faculty projection model extends ten years-- the limit of reasonable accuracy and audience interest.

The faculty/tenure planning model first requires determining the current percentage of faculty tenured. We find there are at least three ways to calculate this percentage:

1. All full time faculty including those on leave, but excluding their temporary replacements,

2. HEGIS faculty methodology, including only those faculty on full time appointment, excluding those on leave, or

3. The FTE pure faculty approach which includes only those tenured faculty at their appointed level, e.g. a tenured faculty member on half-time leave is counted as one half an FTE.

We chose the most realistic method of calculating percent tenured, all full time faculty including those on leave, but excluding their temporary replacements. This method fits the way the University actually works. The university has an obligation to tenured faculty regardless of leave status. Other methods of computing percent tenured could cause tenure levels to fluctuate from year to year while no appreciable changes have occurred, or the tenure percentage might not realistically indicate operational flexibility. Decision makers need both reliable and operational information.

The faculty/tenure planning model is primarily cohort based. Continuing Professors, Associate Professors, and Assistant Professors are projected using progression rates (the number continuing in rank divided by the total number in the previous year.) The most recent two year average progression rate of each cohort is employed as most representative of the future activity of the group. Cohorts for Associate and Assistant Professors are based on the number of years since initial appointment. Promotions from Associate to Full Professor are calculated as a two year average ratio of the total size of the

Associate Professor group to the number promoted to Professor. Associate Professors are projected on the basis of three progression rates from hiring to tenure in the fourth year. Assistant Professors are progressed through seven progression rates to arrive in their eighth year as tenured Associates. In other words, there are seven cohorts from the first to the eighth year. These cohorts are all used to allow sensitivity to the size of the eighth year group entering the tenured associate rank. We assume faculty growth over the next ten years will be primarily at the Assistant Professor level. This assumption may naturally change with shifts in hiring practices which are reviewed annually. In this way, the total number of Assistant Professors are kept at realistic levels and the size of the cohort for promotion and tenure for each year will be accurately reflected. Assistant Professors returning for an eighth year are assumed both promoted to Associate Professor and tenured. Associate Professor returning for a fourth year are also assumed tenured.

The faculty planning process has so far indicated no serious faculty resource problems. The following are examples of the quality of information which decision makers may draw from Binghamton's faculty/tenure planning model:

1. The promotion and tenure screening process is rigorous and effective.
2. Current tenure practices allow ample space for future tenure awards.
3. There are no compelling reasons to restructure existing faculty resources.
4. The five year faculty resource plan remains coherent and a reasonable planning base.

CONCLUSION

These examples are a sample of the applied focus of the Office of Institutional Research at SUNY-Binghamton. This approach has proved to be an effective strategy for supporting institutional decision making.

A STUDY OF THE ECONOMIC IMPACT OF NEW JERSEY'S COMMUNITY COLLEGES

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Mission and goal statements of community colleges have a common thread in that they invariably state that the primary purpose of community colleges is to provide postsecondary educational opportunities to the adult population of the colleges' sponsorship areas. The statements usually include listings of such valuable outcomes of learning as knowledge, creative capabilities, economic productivity and cultural enrichment.

There are other outcomes of community colleges, usually not presented in the mission statement, that are more direct and more measurable, one of the most significant of which is that they bring revenue to their locality. Community colleges serve as substantial producers of jobs, as consumers of goods and services, as owners of property and as depositors and investors of cash resources that contribute to an expanding credit base.

The people who live in the area in which a college is located often think of the institution in terms of their own personal social interactions with its students. Merchants, landlords, bankers and other business persons may be sensitive to the students and college employees as sources of additional income for their business venture. However, the total economic relationship between the college and the community is not generally known.

Educators and economists have been measuring the economic impact of colleges for about twenty years. In essence, they have treated colleges as business enterprises, excluding the long term educational benefits of their existence and measuring the current direct economic contribution to the community. Community colleges have been the focus of much of this activity.

Economic impact studies are attempts to measure the circulation of college expenditures in the local economy. The studies measure employment, business volume, tax revenues, bank credit and personal income, and state and federal revenues. They also employ multipliers to more accurately measure cash flow.

An economic impact study enables a community college to improve its position with its funding sources. Community and college relations are documented. Political leaders are made aware of the tax burden eased and tax revenues generated. Faculty and staff become more aware of their contribution to the economy. Taxpayers see that their outlay does not just disappear and college administrators have a useful tool in making decisions about the future direction and priorities of their institutions.

Economic impact studies are of substantial value to administrators and faculty at community colleges because they provide comprehensive data for political purposes. Without them, endeavors to achieve greater local and state appropriations will be handicapped by the lack of tangible and reliable information on the measurable economic returns to be expected from the dollars invested in community colleges. The results of economic impact studies often are surprising to the public and, indeed, to the academic community in terms of the prominent economic status of the college as an employer, consumer of goods and services, investor and property owner.

THE PROJECT

An economic impact statement survey was developed. The elements of the survey were determined by a comprehensive literature review and consultation with the Project Advisory Committee. The survey was developed for use by each community college and was designed to help colleges calculate their direct economic impact on their counties. The survey was field tested at Brookdale Community College, Salem Community College, and Passaic County Community College.

Following field testing, the survey was revised and distributed with guidelines for implementation to all nineteen New Jersey Community Colleges. Appropriate College officials completed the survey and estimated the economic impact of their Colleges on their Counties. The Colleges needed to receive the survey in early December 1982 so it could be utilized in defense of College requests for additional County appropriations that began, by statute, on February 1, 1983. The Association of Community College Presidents of New Jersey requested that appropriate college officials cooperate and particiapte in the Project.

The data generated by the application of the survey were used to estimate the economic impact of the community college sector on the State of New Jersey. The local data were supplemented with appropriate statewide information and economic indicators. The statewide economic impact statement was reviewed and used by the Project Advisory Committee. The statement contained information primarily for use in the State Legislature's appropriation process and secondarily for other sector-wide public relations purposes. The statewide statement was completed by late February to be used in the FY1984 appropriations process that started in late March 1983. The Legislative Committee of the Council of County Colleges of New Jersey used the statement in its testimony to the Joint Appropriations Committee of the Legislature.

A suitable substitute for the time consuming task of developing and implementing a survey of staff and students was an objective of this project. A two step process was developed to substitute for the survey of staff and students.

First, college records were searched for several items of basic information as follows:

1. The total number of College employees was obtained from calendar year 1981 payroll records. W-2 information or FY 82 budget data would also have included the information.
2. The number of college employees who live in the County was obtained by reviewing address information on payroll or in College directory. If part-time data were not readily available, the full-time percentage was used.
3. The number of college employees who live in New Jersey was obtained by reviewing address information on payroll or in College directory. If part-time data were not readily available, the full-time percentage was used.
4. Total disposable income available to College employees was available in College Business Records. The figure was money paid directly to staff and did not include taxes and retirement.
5. The total number of full-time students was available from the end of fiscal year audit. Fall 1981 audited data were used.

6. The total number of part-time students was available from the end of fiscal year audit. 1981 audited data were used.

7. The average annual college-related expenditures by full-time students were available from the Financial Aid office. The figure excluded tuition and fees.

8. The average annual college-related expenditures by part-time students were available from the Financial Aid office. The figure excluded tuition and fees.

Second, after the data available from various College offices were gathered, the models called for estimates of income spent on non-housing and rental items. Standard government documents were consulted to provide Country averages for each item.

To determine the percentage of expenditures spent on non-housing items, the June 9, 1982 edition of New Jersey Economic Indicators was reviewed. The publication included a U.S. Bureau of Labor Statistics exhibit titled "What the Average Middle Income Family Spends." The exhibit projected annual costs for a typical family of four. Costs were based on a collection of goods and services that was assumed to be typical in 1981 and not what households actually spent in 1981. The middle income figures were used, despite the fact that several New Jersey counties have upper income average households, in order to understate the variable in the total estimated economic impact.

The percentage of staff who rent and how much they spend on rental expenditures was calculated by reviewing two 1980 Census publications. The first, entitled "Housing Units, Occupancy Status, Units in Structure, and Year Structure Built" (U.S. Census), contained important information on the percentage of residents of each County in New Jersey that lived in rental housing.

The average monthly rental price by County was also found in a 1980 Census document, this one entitled "Gross Rent and Monthly Owner Housing Costs."

The use of the retail gravity model had been one of the most troublesome aspects of estimating economic impact for community college officials. A substitute was developed by the following process which utilized two sources of information:

1. For the purposes of understatement of the variable in the economic impact estimate, the highest in-county expenditure percentage to be used in the project was established at 75 percent.
2. The 1981 estimated total retail sales volume, as presented in the July 1982 edition of Sales and Marketing Management Magazine, was reviewed. The retail sales volume is an indicator of the wealth and diversity of a County's economic base.
3. In-county expenditure percentages were arbitrarily assigned to all counties as per their retail sales volume. Counties with less than $1 billion in sales were assigned 60 percent; counties with $1 billion to $2 billion in sales were assigned 65 percent; counties with $2 billion to $3 billion in sales were assigned 70 percent; and counties with sales over $3 billion, and the State of New Jersey, were assigned 75 percent.

THE RESULTS

Seventeen of New Jersey's community colleges participated in the project. The combined economic impact of the sector on the State of New Jersey is detailed as follows:

Total New Jersey expenditures by the colleges	$ 54,813,718.99
Total employee expenditures in New Jersey	51,691,526.00
Total student expenditures in New Jersey	222,316,699.00
Total initial economic impact of the colleges on the County	328,821,943.00
Multiplier recommended by Caffrey and Isaacs	2.5
Total Estimated Economic Impact	$822,054,857.50

The State of New Jersey received an estimated economic impact of $822 million on an initial investment of $52 million in Fiscal Year 1982. The return of 15 to 1 is similar to the impacts estimated by studies of community college systems in Virginia, Maryland, Washington, Illinois and Michigan.

CONCLUSIONS

This project was significant in that it is one of the few economic impact studies that has included an entire community college sector. It is the first time a group of New Jersey colleges has been researched in the same economic impact study, this producing comparative data. Beyond these points of significance that deal with the rarity of this kind of research enterprise, there are some additional points of statistical importance:

1. The impact of the community college system on the

State of New Jersey is impressive. The Sector contributes over $800 million to the State's economy on an initial investment of $56 million.

2. In Fiscal Year 1982, with unemployment in New Jersey over 9 percent, the community college sector contributed 27,000 full-time jobs to the state's economy, only 6,000 of which were funded by the colleges.
3. The average cost per job, calculated by dividing the number of jobs created by the sector by the State's share of the sector's budget, is less than $2,000.
4. Each of the community colleges in New Jersey has a significant economic impact on its county, ranging from a low of $5.9 million to a high of $71 million.

Computer and Technological Applications

COST-BENEFIT ANALYSIS FOR ACADEMIC DEPARTMENTS USING A MICROCOMPUTER

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As a small liberal arts college concerned about its future survival in a competing society, Mount Saint Mary College decided to take a closer look at the institution's operating costs, program organization, and managing processes. The administration recognized that some problems rest upon overall limited resources including declining enrollments, the recent upward adjusting of tuition as a ratio of revenue, and the reality of increasing operational costs. In order to deal with these changes, the administration focused upon the cost of academic programs.

In 1977, the College used the NCHEMS academic costing model as part of the New York State Institutional Information Systems Project. Upon completion of this pilot program, Sister Marie Genevieve Love, Director of Institutional Research and Planning, attempted to continue an annual study using a manual approach. Data and ratios, in addition to the initial base, were added. In summary, accurate data were sought for:

- Cost of instruction by department
- Total cost of instruction per student in various majors
- Faculty and department course load
- Student enrollment (FTE) by department and by class

The data elements were derived from the computerized student registration, faculty course assignments, payroll records and annual financial reports. For twenty-one disciplines and eighty total faculty members, it was possible to complete the data entry forms manually. The computation of ratios became a task that would be substantially eased by computer assistance.

In 1982 Colleen Fennell, a research assistant at State University of New York at Albany, prepared the data for entry into the computer by designing a template on the software program, VisiCalc. The project was limited to the analysis of data applying only to academic programs and departments. This analysis was to be the catalyst for future analysis of support areas.

VisiCalc, an electronic spreadsheet, was determined to be most useful because raw data items could be organized and then assessed in one section.

The raw data was used to generate other sophisticated data resulting from computations. A mock up using mythical figures was designed. A two page copy of the model is attached (Chart I).

COST-OUT BY DISCIPLINES

Page 1 (Columns 1 through 12) of the model contains basic data regarding personnel salaries, allocations of costs and various types of load, essentially data derived from student registration and personnel files. Some of the basic data was derived from simple calculations made prior to data entry into VisiCalc. This includes individual faculty members' totals for student enrollments, contact hours and credit hours taught, and administrative allocations.

The salaries' section consists of four categories of staff: instructional faculty, instructional administration including program development, project leadership or other functions not directly involved with the offering of instruction directly to students, clerical assistance, and support staff including student assistants, lab assistants, aides and the like.

The bottom portion of the page lists expenses in several categories as allocated to departments for instructional and operational purposes. It is presumed that all such expenses are essentially in direct support of instructional imperatives, if not actually an instructional resource expense.

Column 3 on page 1 is entitled Cost Transfer. This refers to monies that are to be accounted for elsewhere. It should be noted that an amount may be transferred-in which results in a positive value or transferred-out indicated by a preceding minus sign. The symbols at the bottom of the page are to be associated with the cost transfer concept. The "*" indicates that the money was transferred-in (+) to the department under analysis or transferred-out (-) of the department. While a code could be devised to indicate what department the transfer was made to or from, it was determined to be unnecessary since these transfers would be accounted for as appropriate functions and/or departments were analyzed.

An interesting phenomenon occurs at the Mount which explains the symbol "#" standing for Dual Course. Some courses are listed in the schedule under two different names by two different departments. However, the schedule time for the course is the same and it is taught by one teacher who is teaching a mixture of students who have signed up for the course according to their own program requirements. So that an accurate cost-out occurs, salary costs for these special courses are distributed to various departments on a student enrollment ratio and are so designated by the # symbol in each department's analysis.

The "," symbol by a name or item indicates that the amount listed is only part of the total amount of salary for that person or function because the actual salary or cost has been divided between two or more departments. This is different from a transfer as the division of money is planned as part of the original allocation to each department.

If there is no symbol by the name or item and yet a cost transfer is indicated, it means that the transfer has taken place within the department. This is exhibited in Instructional Administration by the titles Ch.Dp. C and Prg.Dv. E. which designates dollar allocations to functions served by Instructors C and E in that department. The Div.Ch.* is an allocation for the Division Chairperson that is being charged to this department.

Page 2 (Columns 13 through 20) of the model presents computational data derived from data on Page 1 to determine net costs of salary and/or expense of instruction.

In the case of this report, division by ZERO as well as divisions involving an ERROR value will result in the reporting of the value of ERROR. Thus, all ERROR notations on this report are merely program indications that no computational result is expected since one of the phenomena in the set of calculations does not have an expected value. An example of this is seen in Column 13 for clerical staff.

Sub-total and Department Total lines are not totals for columns but are actually averages for the department with respect to the given set of computations. Columns with figures, therefore, do not result in totals from addition or subtraction and ERRORS result in sub-categories that include ERROR notations. Figures in the double line at the bottom of the page are also averages for the department. Department totals that do not include EXPENSES are carried down to the lower half of the mock up.

Once the mock up format was designed, required data for each of the 21 academic disciplines were entered into columns 1-3 and 7-12 with columns 4-6 and 13-20 being computed by a formula function. For example, Net Cost (Column 6) is the result of adding Allocated Salaries (Column 4) and Benefits (Column 5). The result of dividing Net Cost (Column 6) by Contact Hours (Column 8) are the figures found in Column 13 entitled $/CtHr showing the cost per contact hour for each instructor or expense in the department.

Upon completion of this task, 21 different spreadsheets showing the cost for each discipline were generated (Chart I, Pg. 2). These costs allowed for comparisons between departments and provide data that may be used to generate other informational reports for decision making.

VARIATIONS IN COST OF BACHELOR'S DEGREE PROGRAMS

Figures from the Discipline cost-out were used to produce the Program by Major cost-out (Chart II) including Core Course costs and indirect costs for each of the programs offered at the institution. It was necessary to estimate the cost of the baccalaureate degree study core for each program. This was done based on the Core Course and distribution requirements for each major field of study. Using the cost per credit hour as developed in the cost-analysis and assuming that all disciplines were to be equally represented in meeting the general core area requirements, an average cost per credit hour was derived. The derived (M) Cost is based on the average cost being multiplied by the credit hour requirement in the core and the median cost estimate for that core area was used. The Derived (H) Cost and the Derived (L) Cost are high and low estimates and assume that a student might choose to meet core study requirements by taking courses, at maximum levels within the highest cost departments or lowest cost departments. This would obviously change the cost of the core. The (H) and (L) serve as parameters. A third informational report that could be generated is a cost-out showing actual costs by studying transcripts of individual students in each major. This has not yet been done.

Indirect costs were derived using a rather gross analysis of other costs of operation. In this instance the special sessions, public service, community education and the instructional costs covered in the departmental analyses were subtracted from the annual budget and the $2,933,199.00 remaining was designated Indirect Cost. The FTE student number was divided into the Indirect Cost, resulting in an annual cost of $3,813.31 per student per year, or $15,253.24 for four years of study. It is recognized that this method assumes no change across the four year period of study. Taking this aspect into account, a comparison of Program by Major Costs may be made across the board which not only shows the difference in the cost of program majors and tuition income generated, but also shows a comparison of other differences. While an analysis was made for each of the program majors offered at the institution, only two majors, English and Chemistry, are exhibited for the purpose of this paper.

While an obvious advantage of completing the above described cost-benefit analysis using VisiCalc is ease of data entry and automatic calculation of the raw data resulting in the ratios for analysis, other advantages include a one time investment in time and effort to set up a format like the model mock up. Once it is formatted, the model or template can be used semester after semester producing informational reports for analysis and comparisons of each semester by entering the new raw data. Format modifications for design or formulas can be easily tried and accomplished as well as easy data adjustment and editing. A special function of VisiCalc, called replicating, allows for one-time entry of a formula which can be copied any number of times where desired on the spreadsheet. For conducting such cost-out analyses, this is especially valuable.

One of the major advantages of VisiCalc is the ability to conduct future scenarios or "What ifs." VisiCalc allows one to ask "What if this were to happen?", enter the data one wants to examine, and see its effect on all the previous calculations. One can look at a limitless variety of possibilities within the parameters of the spreadsheet. This may include a change in salary, personnel, department structure, tuition and load determination methods that were used to produce credit hours generated. It is this use of the generated cost-benefit analysis that has contributed to Mount Saint Mary's planning and operating processes and other decisions affecting the institution.

MANIPULATING DATA ON PROFILE III + SOFTWARE

Using the VisiCalc program to conduct infinite "What ifs" to see the effect WITHIN a department is quite easy and beneficial. While a comparison BETWEEN academic departments can be made by comparing each printed spreadsheet, an easier and more comprehensive comparison can be accomplished by using another software program called Profile III+. This is a Data Base Management System, popularly called an electronic file cabinet. This program allowed the manipulation of data for all 21 departments at the same time. Pursuant to the user's commands, data were arranged to produce information in various report formats.

The data were transformed from the VisiCalc spreadsheet to the Profile III+ format. However, only the TOTALS from the VisiCalc spreadsheet were used in the Profile III+ data base. The use of TOTALS was an arbitrary decision. If necessary or desired, all the data from the spreadsheet could have been included in the data base.

A first step to establishing the data base in the Profile III+ management system was to define the fields or data items and to design a screen for the arrangement of the data. Similar to the VisiCalc spreadsheet, the data were divided into two sections as shown by the single dotted line in Chart III. The upper portion is the basic data and the bottom portion is the ratio data. While this looks similar to the spreadsheet which merely holds data, the advantage is the ability to manipulate data through indexing, searching, selecting, and sorting. The example shown here (Chart IV), entitled "COST ANALYSIS FOR INSTITUTION OF HIGHER EDUCATION", displays four selected data items: department, cost per Contact Hour signified by $/CT HR, cost per Credit Hour Taught designated as $/CR HR TCH and cost per Credit Hour Generated designated as $/CR HR GEN. The report is sorted in numerical order from low to high on the field or data item $/CR HR GEN which shows the average cost per credit hour generated for each department. The report format could easily be arranged to produce a report showing all 21 departments in alphabetical order or numerical order on one of the other fields. It could also produce a report showing only departments that have a cost per credit hour generated ($/CR HR GEN) greater than a specific dollar figure having a particular decision implication. For example, $30.00 per credit hour generated might have such usefulness. If so, it could be used in selecting and sorting.

Data adjustment, continuous updating of data for each semester, and "What ifs" can include the addition or elimination of programs to determine cost effects on the remainder of the institution's revenues. Another "What if" might be the establishment of desired operational-cost criteria to see which departments or programs meet them. An additional attraction of this program is its capacity to merge with other software programs such as VisiCalc and Superscripsit, a word processing program.

SUMMARY

Using VisiCalc and Profile III+ makes conducting a cost-benefit analysis functionally easier by allowing easy data entry and manipulation. More sophisticated analysis can be accessed by asking "What if" questions that can be answered numerically within a matter of moments. One should be cautioned, however, that success in using these programs efficiently and productively is dependent upon a well planned approach to the integration of the existing manual system and the emergent electronic one. Staff members must be prepared to deal with the system and raw data must be accurate in order to produce useful information. In addition, the administration must realize that the initial investment of time and effort is considerable and will pay off in the long run only if attention is paid to accuracy, validity and relevance of data and program format. The acquisition of these aspects require time, patience and perseverance, but the pay-off in terms of support for decision making is worth the effort.

Mount Saint Mary College has accomplished cost-benefit analyses and the establishment of an initial data base using the VisiCalc software. It has already moved to the more sophisticated data base management software, Profile III+. Each has provided information to the college with a format upon which to conduct an annual look at the costs of operating academic programs, thus enabling the institution's administration to adjust to changes in amounts, sources, and utilization of its resources.

BEST COPY AVAILABLE

CHART I

(Model Mock Up)
COST-ANALYSIS: (SEMESTER 'YR)

Pg.1 MODEL-----Salaries	1 Name	2 Contrt.Sal	3 CostTrfr	4 Alloc.Sal	5 Benefits .138	6 NetCost	7 F.T.E.	8 CtHrs	9 CrHrsTch	10 CrHrsGen	11 StuEnr	12 # Sects.
Instruct.	1.Instru A	10000.00	0.00	10000.00	1380.00	11380.00	1.00	12.00	12.00	300.00	100.00	4.00
	2.Instru B	12000.00	0.00	12000.00	1656.00	13656.00	1.00	12.00	12.00	300.00	100.00	4.00
	3.Instru C	16000.00	-4000.00	12000.00	1656.00	13656.00	0.75	9.00	6.00	240.00	120.00	3.00
	4.Instru D	9000.00	0.00	9000.00	1242.00	10242.00	1.00	12.00	12.00	300.00	100.00	4.00
	5.Instru E	21000.00	-6000.00	15000.00	2070.00	17070.00	0.71	9.00	9.00	180.00	60.00	3.00
	SubTot-In.	68000.00	-10000.00	58000.00	8004.00	66004.00	4.46	54.00	51.00	1320.00	480.00	18.00
Inst.Adm.	1.Ch.Dp. C		4000.00	4000.00	552.00	4552.00	0.25	3.00	0.00	0.00	0.00	0.00
	2.Div.Ch.*		3000.00	3000.00	414.00	3414.00	0.25	3.00	0.00	0.00	0.00	0.00
	3.Prg.Dv.E		6000.00	6000.00	828.00	6828.00	0.29	3.00	0.00	0.00	0.00	0.00
	SubTot-IA	0.00	13000.00	13000.00	1794.00	14794.00	0.79	9.00	0.00	0.00	0.00	0.00
Clerical	1.Sec A	1375.00	0.00	1375.00	189.75	1564.75	0.33	0.00	0.00	0.00	0.00	0.00
	2.Sec B	1250.00	0.00	1250.00	172.50	1422.50	0.25	0.00	0.00	0.00	0.00	0.00
	Subtot-Cle	2625.00	0.00	2625.00	362.25	2987.25	0.58	0.00	0.00	0.00	0.00	0.00
Sup.Staff	1.Wk.StyA	1360.00	0.00	1360.00	187.68	1547.68	0.50	0.00	0.00	0.00	0.00	0.00
	2.Wk.StyB*	1360.00	-680.00	680.00	93.84	773.84	0.25	0.00	0.00	0.00	0.00	0.00
	3.Oth.StfC	1600.00	0.00	1600.00	220.80	1820.80	0.50	0.00	0.00	0.00	0.00	0.00
	Subtot-SS	4320.00	-680.00	3640.00	502.32	4142.32	1.25	0.00	0.00	0.00	0.00	0.00
DEPARTMENT	TOTALS	74945.00	2320.00	77265.00	10662.57	87927.57	7.08	63.00	51.00	1320.00	480.00	18.00

MODEL-----Expenses	Items	TotalCost	CostTrfr			NetCost						
	1.Travel	800.00	0.00			800.00						
	2.Off.Supp	1120.00	-100.00			1020.00						
	3.Copying	1000.00	0.00			1000.00						
	4.Phone	500.00	150.00			650.00						
	5.Equipt.	1500.00	2000.00			3500.00						
	6.Prof.Ser	1500.00	350.00			1850.00						
	7.Other	1500.00	-280.00			1220.00						
DEPARTMENT	TOTALS	7920.00	2120.00	77265.00	10662.57	10040.00	7.08	63.00	51.00	1320.00	480.00	18.00
MODEL	DEPT.TOTALS	82865.00	4440.00	77265.00	10662.57	97967.57	7.08	63.00	51.00	1320.00	480.00	18.00

* - TRANSFER IN/OUT OTHER DEPARTMENT # - DUAL COURSE ' - SPLIT BETWEEN DEPARTMENTS

CHART I

MODEL-----Salaries	1 Name	13 $/CtHr	14 $/CrHrTch	15 $/CrHrGen	16 AvgClSize	17 $ Rate per FTE	18 CtHr per FTE	19 CrHrTch per FTE	20 CrHrGen per FTE
Instruct.	1.Instru A	948.33	948.33	37.93	25.00	11380.00	12.00	12.00	300.00
	2.Instru B	1138.00	1138.00	45.52	25.00	13656.00	12.00	12.00	300.00
	3.Instru C	1517.33	2276.00	56.90	40.00	18208.00	12.00	8.00	320.00
	4.Instru D	853.50	853.50	34.14	25.00	10242.00	12.00	12.00	300.00
	5.Instru E	1896.67	1896.67	94.83	20.00	24042.25	12.68	12.68	253.52
	SubTot-In.	1222.30	1294.20	50.00	26.67	14799.10	12.11	11.43	295.96
Inst.Adm.	1.Ch.Dp. C	1517.33	ERROR	ERROR	ERROR	18208.00	12.00	0.00	0.00
	2.Div.Ch.*	1138.00	ERROR	ERROR	ERROR	13656.00	12.00	0.00	0.00
	3.Prg.Dv.E	2276.00	ERROR	ERROR	ERROR	23544.83	10.34	0.00	0.00
	SubTot-IA	1643.78	ERROR	ERROR	ERROR	18726.58	11.39	0.00	0.00
Clerical	1.Sec A	ERROR	ERROR	ERROR	ERROR	4741.67	0.00	0.00	0.00
	2.Sec B	ERROR	ERROR	ERROR	ERROR	5690.00	0.00	0.00	0.00
	Subtot-Cle	ERROR	ERROR	ERROR	ERROR	5150.43	0.00	0.00	0.00
Sup.Staff	1.Wk.StyA	ERROR	ERROR	ERROR	ERROR	3095.36	0.00	0.00	0.00
	2.Wk.StyB*	ERROR	ERROR	ERROR	ERROR	3095.36	0.00	0.00	0.00
	3.Oth.StfC	ERROR	ERROR	ERROR	ERROR	3641.60	0.00	0.00	0.00
	Subtot-SS	ERROR	ERROR	ERROR	ERROR	3313.86	0.00	0.00	0.00
DEPARTMENT	TOTALS	1395.68	1724.07	66.61	26.67	12419.15	8.90	7.20	186.44
MODEL-----Expenses	Items								
	1.Travel	12.70	15.69	0.61		112.99			
	2.Off.Supp	16.19	20.00	0.77		144.07			
	3.Copying	15.87	19.61	0.76		141.24			
	4.Phone	10.32	12.75	0.49		91.81			
	5.Equipt,	55.56	68.63	2.65		494.35			
	6.Prof.Ser	29.37	36.27	1.40		261.30			
	7.Other	19.37	23.92	0.92		172.32			
DEPARTMENT	TOTALS	159.37	196.86	7.61	26.67	1418.08	8.90	7.20	186.44
MODEL	DEPT.TOTALS	1555.04	1920.93	74.22	26.67	13837.23	8.90	7.20	186.44

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CHART II

EXPLANATION OF DERIVED CORE COST (41 Credit Hours Required)

DISCIPLINE Made up of	$/CrHrGen (Discipline)	$/CrHrGen (Average)	CrHr Req.	Derived (M)Cost	Derived (H)Cost	Derived (L)Cost
ENG/CMA						
English	48.56	47.29	6.00	283.74	291.36	276.12
Commun.	46.02					
SCI/MATH						
Math	40.62	51.28	11.00	564.06	914.43	319.00
Comp-Sci	29.00					
Chemistry	60.59					
Biology	83.13					
Physics	43.05					
TOTAL CORE COST						

EXPLANATION OF DERIVED INDIRECT COST

Total Annual Budget:
Special Sessions:
Public Service:
Community Education:

Residual Budget:
Instructional Cost:

Indirect Cost:

Number of Students: 1038.00
F.T.E. Students: 769.20

Indir.Cost/FTE(Student) for
1 Year
4 Years

Indirect Cost:

Tuition Income:

PROGRAM COST BY MAJOR

Major	Discipline	CrHr Req.	$/CrHrGen	Disc.Cost	Total Instr.Cost	Total Cost of Major	Cost Difference
English	Core	41.00	*				
(120)	English	30.00	48.56				
	Electives	49.00	47.99				
Chem	Core	41.00	*				
(120)	Chemistry	30.00	60.59				
	Biology	8.00	83.13				
	Physics	8.00	30.51				
	Math	9.00	40.62				
	Electives	24.00	47.99				

CHART III

```
COST-ANALYSIS:INST:MT. ST. MARY    .SEMESTER:FALL       . 1982.
=================================================================
DEPARTMENT: Chemistry .           FTE:          3.25.
CONT.COSTS:                       CT HRS:       45.00.
COST TRFR:                        CR HRS TCH:   20.00.
ALLOC.SAL:                        CR HRS GEN:      544.00.
BENEFITS:                         STU ENR:      272.
NET COSTS:                        # SECTS:      13.
-----------------------------------------------------------------
 $/CT HR:                          $ RATE/FTE:
 $/CR HR TCH:
 $/CR HR GEN:                      CT HR/FTE:       13.85.
                                   CR HR TCH/FTE:  6.15.
 AVG CL SIZE: 20.92.               CR HR GEN/FTE: 167.38.
_________________________________________________________________
#    5  D-Delete,  H-Hardcpy,  U-Updte,  X-End,  ENTER-Next
```

CHART IV

```
                           COST ANALYSIS FOR INSTITUTION OF HIGHER EDUCATION
                           09/21/83                                 Page     1

SORTED BY
$/CRHR GEN      RECORD NO.      DEPARTMENT      $/CT HR    $/CR HR TCH      $/CR HR GEN

                       4        Language         100.00     100.00             20.00
                      21        Health           400.00     500.00             30.00
                      20        Religion                                       40.00
                      19        Bus/Eco                                        50.00
                      18        Phys-Ed
                      17        Sociology
                      16        Comp-Sci
                      15        Philosophy
                      14        Psychology
                      10        Physics
                      13        Art
                      12        History
                      11        Math
                       9        Communicat
                       8        English
                       7        Pol-Sci
                       6        Education
                       5        Chemistry
                       3        Biology
                       2        Nursing
                       1        Music




RECORDS SELECTED    21
```

MARGINAL COSTS AND FORMULA-BASED FUNDING

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Marginal cost is the cost of producing an additonal unit. In higher education, one marginal cost would be the cost of educating an additional student. Formula-based budget determination for public higher education is usually based on average cost per student. This study estimates marginal cost and compares it with average cost.

Because marginal costs are believed to be lower than average costs, the use of average costs in calculating budgets was never an issue in higher education during the expansionary years. Institutions would receive more money than necessary to educate additional students and use these extra funds to improve facilities or the quality of programs. However, today, if a public institution experiences a decline in enrollment, then a budget based on average cost will take away more funds from the school than would the use of marginal cost or the true cost of educating these additional students. These cuts could damage or hamper the mission of the institution.

There are several methods for estimating marginal costs: The incremental method, the fixed-variable cost method and the regression method. Each method has its own particular set of advantages and drawbacks.

The incremental method consists of identifying the effect of changes in the number of students on total costs. These effects are distinguished from changes in total costs that are a direct result of environmental or decision factors. For example, inflation would be considered as an environmental factor; whereas, an increase in faculty salaries due to a collective bargaining agreement is an administrative decision. Although it is theoretically a simple method, it is difficult to separate the interactive effects of changes in enrollment, the environment and administrative decisions.

The second method, the fixed-variable cost method, separates fixed costs from the costs that vary with enrollment. In this instance, marginal costs equal average variable costs. For example, plant operations, inflation factors and cost increases due to administrative decisions could be considered as fixed costs, and other costs that vary due to enrollment changes could be defined as variable costs. This method helps in identifying key cost variables and protects certain needed services and facilities from funding cutbacks due to environmental factors; however, a political process must determine which costs are fixed and which are not fixed. Furthermore, in the absolute long run, all costs are marginal and in the absolute short run all costs are fixed. An appropriate planning period must be chosen that is consistent with the purpose of the cost analysis.

The third method, the regression method, is the central focus of this paper. It involves using regression analysis to estimate the coefficients, or marginal effects, of various independent variables. This method is most useful in determining general cost patterns as opposed to determining actual marginal costs because results vary with the choice of functional form, linear or non-linear, of the equation (Allen and Brinkman, 1983).

METHODOLOGY

Regression analysis requires the specification of a model. In this instance, only two very simple equations were developed due to theoretical constraints and data limitations.

The regressions on the equations below used 1982 and 1983 data from the Amherst campus on instructional costs by general program areas and program area enrollment. Although several non-linear forms of the equations were estimated the linear model appeared to be the best.

(1) $\text{Cost}^* = a_o + a_1 \text{ Level} + a_2 \text{ Program Area} + a_3 \text{ FTE} + u_a$

(2) $\text{Cost} = a_o + a_1 \text{ Level} + a_2 \text{ Program Area} + a_3 \text{ Headcount} + u_a$

Where

Cost = Faculty salaries
a = coefficients
u = disturbance term

Level = Undergraduate = 1
= Graduate = 2

Program Area = Arts and Sciences = 1
Business = 2
Engineering = 3
Allied Health = 4
Other = 5

FTE = Full Time Equivalent = the number of undergraduate credit hours divided by 15 and the number of graduate credit hours divided by 12

Headcount = a count on the number of students in attendance

* Cost data have been transformed into 1983 dollars

The dependent variable, faculty salaries, was chosen because of data limitations. However, it does represent a large portion of general program area costs. The first two independent variables controlled for variation in instructional cost due to level of education or general program area. The other two independent variables, headcount and FTE, measured the influence of enrollment changes on instructional costs.

Separate regressions were run on these two equations using ordinary least squares. The first used FTE as the unit of measurement for enrollment, and the second used headcount. This quantified the changes in marginal cost that result from using different units of measurement.

RESULTS

The results follow the same pattern that was found in various other studies on marginal costs in higher education (Brovender, 1974, Verry and Davies, 1976, Razin and Campbell, 1972). The model results supported the studies' hypothesis that marginal cost was below average cost indicating the existence of economies of scale.

Regression Results

Equation 1

	Level	Program Area	FTE
Regression Coefficient	2595098	-841054	1221
t statistic	(4.2)*	(2.9)*	(10.7)*

F statistic = 53* R^2 = .86
n = 20

Equation 2

	Level	Program Area	Headcount
Regression Coefficient	2813034	-1317467	1594
t statistic	(5.0)*	(-4.9)*	(11.6)*

F statistic = 63* R^2 = .88
n = 20

*significant at .05 and .01 level

The estimated coefficients for FTE and headcount are the marginal costs of instruction for one additional student.

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Instructional Cost

Amherst Campus
1982-1983

Unit of Measurement	Average Cost	Marginal Cost
FTE student	1932	1221
Headcount	1791	1594

The marginal cost per FTE was 63% of the average cost per FTE. Most studies agree that the ratio lies between 55 and 65%. On the other hand, the ratio of marginal cost over average cost using headcount as the unit of measurement was much higher at 89%.

Significantly, the marginal cost of instruction using headcount as a unit of measurement was noticeably higher than the marginal cost of educating a FTE. This is of interest because average cost per person (headcount) is lower than average cost per FTE. Although it is less costly to educate a student body that contains part time students, an increase in part time students is more costly than an increase in more students taking full time courseloads. This may be due to the possibility that an increase in the number of students would be accompanied by a larger strain on course requirements and an expansion in alternative classroom hours as opposed to an increase in courseloads for existing students.

CONCLUSION

In essence, formula driven budgets that are based on average cost ignore the existence of economies of scale. Marginal cost is a more accurate cost to use when measuring increases or decreases.

In addition, formula driven budgets that are based on FTE enrollment do not take into account that it is more expensive to educate an increase in part time students that might raise headcount but hold FTE growth constant or at a slower rate of increase.

The combination of average cost and strict adherence to one unit of measurement in determining budgets result in inequitable allocations. The use of marginal costs and growing awareness about the relationship between full time equivalent and headcount as units of measures for enrollment provide a more balanced method of budget determination.

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A MODEL FOR ESTIMATING NET PRICES FACING POSTSECONDARY STUDENTS IN NEW YORK STATE

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Introduction

This paper describes the first stage in the development of a model that simulates net prices facing students in New York State enrolled in degree-granting postsecondary institutions. From the public policy and institutional presepective, net prices are important among the factors which determine aggregate enrollment demand and enrollment shares among types of institutions (Tierney, 1982, 1980; McPherson, 1978; Jackson and Weathersby, 1975). Net price differences between the public and independent sectors are a continuing policy concern. From the student persepective, net prices are among the factors which determine access and choice.

In the perfect world of theory, net price is defined as the marginal price paid by a resource unit, whether a student or a family, after subsidies have been deducted from the stated price of postsecondary education. Subsidies include non-returnable grant aid but not the "self-help" portion of work and loan aid. In the practical world of model building from exising data sources, the resource unit is commonly defined as the family and net price as the student expense budget minus grant aid from all sources.

Net prices are determined for individual students as student aid from federal, state, institutional and other private sources are deducted from stated prices. Among regulated student aid programs, such as Pell Grants, recipient characteristics and award size are defined by law. Among discretionary student aid programs that are administered at the campus level, student characteristics which are associated with the receipt of aid are less well known (Porter and McColloch, 1982; Barnes and Neufeld, 1980; Huff, 1975). For any given student, deductions to price based on assessed need, merit or other criteria are contained in a "student aid package."

The result of student aid practices is a highly differentiated pricing structure in which the impact of alternative tuition pricing and student aid policy choices is difficult to estimate (Carnegie Council, 1979). Methods for estimating the net price of attendance facing different types of students at different types of institutions have involved the collection of survey data from students and from financial aid records (Olinsky, 1983; Stampen, 1983; Hodgkinson and Thrift, 1982; Hills and VanDusen, 1982; Maryland State Board for Higher Education, 1982; Indiana Commission for Higher Education, 1979). Survey methods have several disadvantages, however. First, they require large outlays of resources. Second, delays between problem specification, data collection, data analysis and report production can be large. Lastly, and most importantly, unless survey data are used to develop generalizable models of the relationships that exist within the pricing system, they do not permit planners to examine the consequences of alternative conditions and policies, the proverbial "what if" questions.

The Student Support Sources model uses readily available data sources to simulate the processes by which family and student resources and financial aid are allocated to different types of students enrolled at different types of institutions in New York State in order to meet student expense budgets. It is not a mathematical model. Rather, it is an analog model which attempts to replicate the aid allocation process on a student by student basis. By nature, a simulation is a simplification of the actual process and may produce results that are insufficiently related to reality for the purposes of decision making. Validation studies in which model results can be compared to actual data must occur before the model can be used to inform policy discussion. Despite these caveats, the relatively low cost of using a simulation model and a model's potential for exploring "what if" questions have provided sufficient incentive for the initial effort described here.

The Model

Student Support Sources is written in BASIC for a Radio Shack Model III microcomputer system with a NEWDOS/80 Version 2.0 disk operating system. The program is menu-driven and designed to be used by non-technical staff. It simulates resource allocation to categorical types of postsecondary students from the major support sources in New York State and calculates alternatively defined values for net prices facing these student types. The model consists of three major functional parts:

(1) The Student/Institution Type Selector;

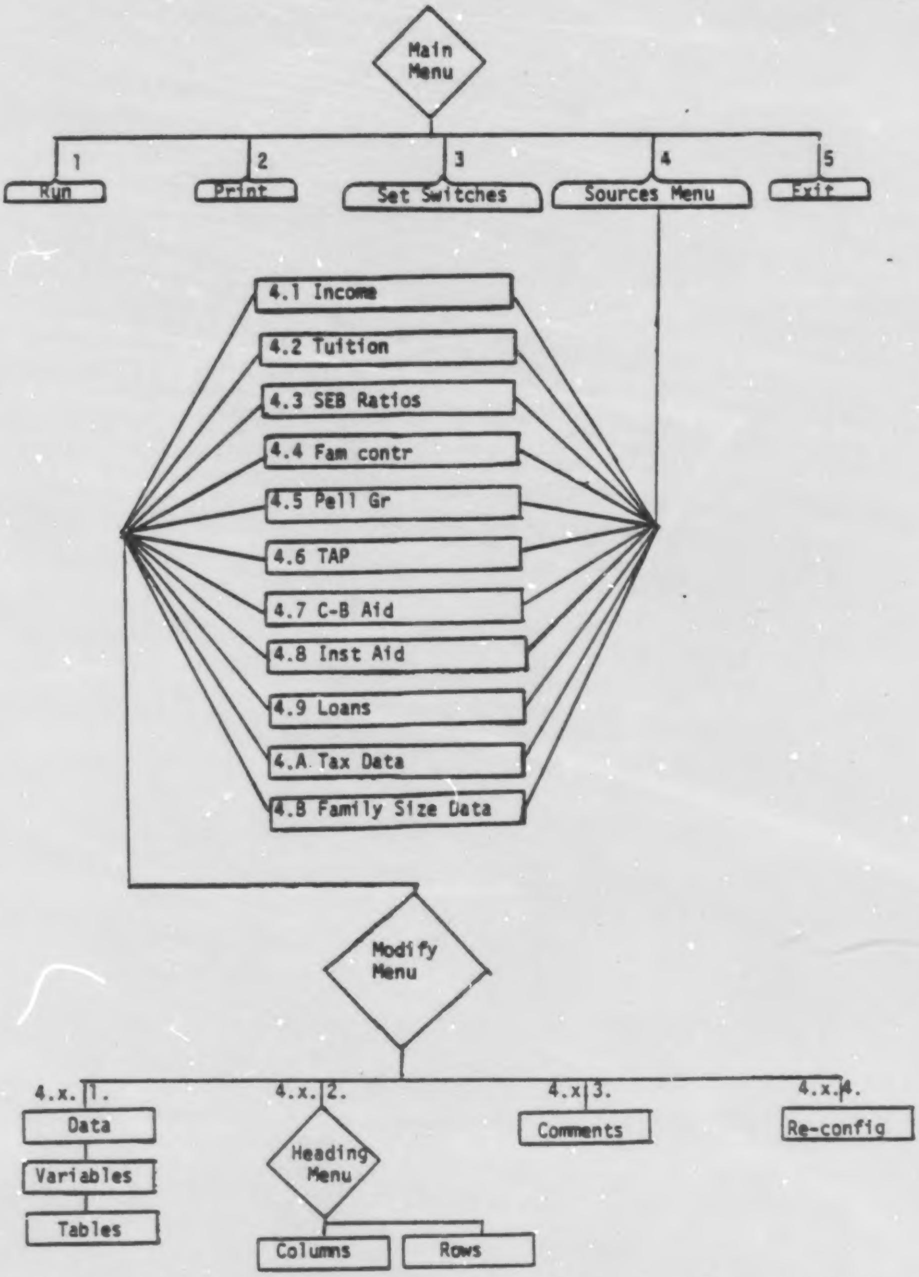
(2) Price and Resource Constraint Data Files; and

(3) The Packaging Calculator.

To calculate the dollar amount available to each type of student from each of seven sources of support, the model locates user defined price and resource allocation constraints and then adjusts the located dollar values to form a "package" of aid.

A diagram of the structure of the program is shown in Figure 1. The Main Menu branches to the four main functions of the program. Option 1 on the Main Menu begins a run of the simulation. During the run, histograms representing each simulated package of aid are displayed on the screen. The packaging algorithm is based on several simplifying assumptions: (1) All institutions add types of aid to a package in the same sequence until the student expense budget is met or until aid sources are depleted. (2) The sequence of aid packaging shifts the costs of attendance as much as possible to publicly

Figure 1. Program Structure


Main Menu
1
Run
2
Print
3
Set Switches
4
Sources Menu
5
Exit
4.1 Income
4.2 Tuition
4.3 SEB Ratios
4.4 Fam contr
4.5 Pell Gr
4.6 TAP
4.7 C-B Aid
4.8 Inst Aid
4.9 Loans
4.A Tax Data
4.B Family Size Data
Modify Menu
4.x. 1.
Data
Variables
Tables
4.x. 2.
Heading Menu
Columns
Rows
4.x 3.
Comments
4.x. 4.
Re-config

To proceed down the hierarchy, you select options on menus. To move up the hierarchy, you press 0.

funded student aid programs and to students and their families. (3) Distinctions among types of aid (grants, loans or employment) are inconsequential for institutions who do the packaging. These assumptions can be accepted only after an adequate validation of the output which results from them.

Option 2 on the Main Menu leads to a printing routine. Hard copy output consists of a table in which information on seven support sources is presented for every student type included in the run. For each source of support, output is shown as a dollar amount and as a percent of student expense budget. Sources of support include Expected Family Contributions, Pell Grants, TAP (Tuition Assistance Program) Awards which are state entitlements, Federal Campus-based Aid, Federally subsized Loans, Institutional Aid, and Others. Finally, two versions of net price are printed for each student type. Net Price 1 refers only to the Expected Family Contribution. Net Price 2 refers to Net Price 1 plus the value of loan indebtedness for the academic year. These two definitions of net price, chosen for their simplicity, refer respectively to short-term and long-term prices, with short-term defined as the year of enrollment. For the 1980-81 data, the net price calculation excludes earnings and loans from the Federal Campus-based programs and from institutional programs. Each of the two net price estimates is printed as a dollar value, as a percent of student expense budget and as a percent of income.

Option 3 on the Main Menu permits the user to set switches that select up to ninety-six student types for each run. These student types represent the four-dimensional matrix formed by four sectors (SUNY, CUNY, Independent and Proprietary), four income points (quartiles), two dwelling groups (resident and commuter) and three emancipation categories (dependent, independent without dependents and independent with dependents).

Option 4 on the Main Menu allows the user to inspect, enter, change or reconfigure the data files which contain cost and resource constraints that apply to each student's package. Most files represent tables in which price or aid constraint data is stored along two student dimensions. By selecting one of these files from the menu, the user can easily inspect and modify the contents of the file, modify the headings associated with the file, or reconfigure the entire file. Changes to the cost and resource constraint files are easy to make so that the user can readily simulate actual or proposed policy programs.

Data Requirements of the Model

The data requirements of Student Support Sources are relatively modest. A brief description of the major cost and resource constraint files is presented below, with data sources that were used for the 1980-81 academic year simulation run. For 1980-81, sector cost constraints were the mean values of tuition and six student expense budgets for all institutions in each sector. However, values for price constraints can be calculated at any level of aggregation within sectors, including individual institutions, so that sector breakdowns of policy interest can be obtained.

For each run of the model, four income points are stored for dependent students and four are stored for independent students. For 1980-81, income points representing midpoints of income quartiles were obtained from the College Scholarship Service, Institutional Summary Data: New York State Report. The major drawbacks of this data source are that it represents aid applicants rather than enrolled students and that it excludes CUNY's aid applicants, because CUNY conducts its own need analysis. No existing data source is ideal, however, and multiple runs of the model for any given year permit the use of an unlimited number of income points.

Tuition values are stored in a one-by-four array, with one tuition value per sector. The Higher Education Data System (HEDS) at the New York State Education Department collects tuition data annually.

Student expense budget data form a six-by-four array in which six student types per sector are represented. The student types include both resident and commuter students for each of the three emancipation categories. Student expense budget data were obtained from the records of the Bureau of Higher Education Opportunity Programs of the New York State Education Department. This data source represents a sizable sample of all CUNY, SUNY and Independent institutions and contains reliable data on budgets for all six types of students. For the proprietary sector student expense budget data, the College Scholarship Service College Cost Book was used. This data source was less detailed.

Expected Family Contribution data taken from the College Scholarship Service's New York State Report are contained in a table of twenty-six income categories by two emancipation categories. These data represent aid applicants rather than enrolled students and excludes CUNY students.

Pell Grant maxima, minima and flat reductions are stored as single variables. Student income is converted into a Student Eligibility Index (SEI) through a table that replicates the percentage frequency table published by the Department of Education in Pell Grants: End-of-Year Report. By using the summary table, the likely outcome of the Federal need analysis is estimated for each student type and the model does not have to replicate the entire need analysis process.

TAP Award maxima are stored as single variables. Reductions to the annual award ceiling are stored in a table that replicates the "TAP Award Reduction Schedules" published annually by the New York State Higher Education Services

Corporation (NYSHESC). In order to use the TAP Reduction Schedule, however, student income (Federal adjusted gross income) is converted into New York State taxable balance by a formula that includes terms for tax deductions and family size.

The average campus-based award for all three Federal campus-based programs (SEOG, CWS and NDSL) is stored for two emancipation categories per sector. The average is calculated from the annual FISAP Reports available on HEDS. Analysis of data on income and award size from the 1980-81 FISAP Reports for New York State campus-based aid recipients revealed that income had an insignificant effect on award size among campus-based aid recipients when the three programs were considered together. Therefore, the model does not use student income as a determinant of award size. However, since only a small percentage of student receive any form of campus-based aid, separate runs must be conducted for recipients and non-recipients.

Values for loan maxima are stored as single variables. These maxima are published annually by NYSHESC.

Rates at which to allocate institutional aid to student types are stored for each sector. These rates, which are calculated from summary tables of financial aid expenditures published annually by the NYSED Office of Research and Information Systems, are the weakest point in the model. Data on the characteristics of recipients of institutional aid are unavailable on a regular basis.

Limitations of the Model

All model development efforts involve tradeoffs between accuracy, efficiency, feasibility and interpretability. Limitations are unavoidable and must be made explicit to users. There are several obvious limitations to the current version of Student Support Sources. First, the model permits student types to be defined only in categories which pertain to regulated need-based programs. In practice, a variety of student characteristics, such as measured ability, racial/ethnic background, major field of study, and Veteran's status, may also be determinants of the levels of support received from Federal, state and institutional sources. Second, some forms of support, such as Regents' Scholarships, Higher Education Opportuntiy Program awards, Veteran's Benefits, and Social Security benefits are excluded entirely from the model, except to the extent that they are incorporated into the need analysis for Expected Family Contribution. Third, the resource allocation algorithm for Expected Family Contribution, Pell Grants, Campus-based Aid and Institutional Aid uses aggregate data to allocate dollars to individual student types in a deterministic rather than probabilistic fashion. Fourth, the simplifying assumptions upon which the packaging algorithm is based may violate common practice. A survey study of packaging practices in New York State revealed no clear patterns of practice that could guide the development of alternative packaging routines, however (Singh and Winter, 1981). Fifth, the model uses definitions of net price which are simplistic. Students may make enrollment decisions based on more subtle calculations. For example, the subsidy portion of student loans and the default option may be considered reductions to net price. Lastly, no comparison between the model's estimates of typical student packages and actual packages has been made. The existence of a reliable data source based on student questionnaires and financial aid records for the 1981-82 academic year makes a validation study feasible (Olinsky, 1983). Expert review of the model is also a possible source of validation.

Illustrative Results

Table 1 illustrates one kind of information the Student Support Sources model can generate for one academic year. It compares dependent undergraduates who are campus-based aid recipients in the SUNY and Independent sectors. Net price 1 is the same for students at each income point because Net Price 1 is the assessed Family Contribution that results from a standardized need analysis. In contrast, Net Price 2, which includes loans, differs markedly for the two sectors. In the SUNY sector, neither loans nor other forms of support are needed beyond the Expected Family Contribution. According to this table, in the Independent sector, even for the lowest income point, the student expense budget is not met by the combination of expected Expected Family Contribution plus public need-based and institutional aid. Borrowing is necessary for all students in the Independent sector. The low income student in the Independent sector would need to borrow an amount equal to almost half his or her family's annual adjusted gross income. In practice, institutional aid may function differently that it does in the model. From other data sources, we know that low income students do not commonly borrow maximum Guaranteed Student Loans. Nonetheless, it is clear from the table that regulated need-based programs do not shift resources to extremely needy students sufficient amounts to make the Independent sector competitive with comparable public sector institutions.

The Student Support Sources model can also provide trend data. So long as the methodology remains constant over several years, changes in net prices estimated by the model will reveal the impact of changes in price and resource constraints. Finally, information on "what if" questions can be generated easily by entering a variety of changes to price and resource constraint files for any academic year.

Table 1. Net Price Estimates
for Full-Time Dependent Undergraduate
Campus-based Aid Recipients
in the SUNY and Independent Sectors
in New York State, 1980-81

NP1 = Total Expected Family Contribution
NP2 = NP1 + Guaranteed Student Loans
SEB = Total Student Expense Budget

Income (Quartile (Midpoint)	SUNY Sector (SEB = $4064)				Independent Sector (SEB = $7364)			
	NP1	%Income	NP2	%Income	NP1	%Income	NP2	%Income
$ 6000	702	12	702	12	702	12	2726	45
$16500	1333	8	1333	8	1333	8	3833	23
$25500	2346	9	2347	9	2347	9	4847	19
$37500	4064	10	4064	10	4354	12	6026	16

Conclusion

The Student Support Sources model represents a first step in the development of a simulation method for providing policy makers with information about net prices facing postsecondary students in New York State. Limitations to the existing model are numerous and validation has not yet occurred. Further work is required before the model can be used to inform policy decisions at any level. However, the present stage of model development looks promising. An efficient tool for estimating the effects of alternative policy proposals for the various decision points in the student financial aid system is the desired outcome.

Note:
Grateful acknowledgements are extended to Michael Rosenthal of SUNY-Albany for creative programming, and to the staff of the New York State Education Department's Office of Postsecondary Planning and Policy Analysis and Bureau of Higher Education Opportunity Programs.

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External Factors

PRIVATE FUND-RAISING:
A COMPARATIVE STUDY WITH SMALLER AND LARGER INSTITUTIONS

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ABSTRACT

Private fund-raising results for thirty-four selective independent colleges and universities are reviewed for the decade from 1972 to 1982, using measures of the relative importance of fund-raising to institutional operations as well as measures of total proceeds. Institutions are ranked on both achievement and improvement.

METHODOLOGY

A group of thirty-four independent selective colleges and universities was selected as the base for the study, as listed in Table 1. To provide diversity in the mix, small colleges were selected as well as large universities, and institutions with outstanding fund-raising records as well as those with less impressive achievements. Both coed and single-sex colleges were included.

The data source was the tape record of all data supplied by those institutions to the Council for Financial Aid to Education (CFAE) for its annual publication, Voluntary Support of Education, from 1971-72 through 1981-82. No independent efforts were made to check these institutionally supplied data against other public or private sources. Definitions of institutional budgets, enrollments and other variables established by CFAE for these reports were accepted; caution should be used in reviewing the findings inasmuch as the authors made no efforts to check comparability of interpretation of these definitions among the institutions involved.

The principal measure of fund-raising performance used was "total private support," the sum of all private funds received for both capital and current purposes. To derive indices on which large institutions could be compared with smaller ones, several additional measures were computed from the data supplied in the tape:

- "private support leverage"
  - total private support divided by total educational and general expense
- "average alumni gift"
  - total dollars from alumni divided by total alumni of record
- "alumni participation"
  - alumni donors to annual fund divided by total alumni of record.

Since this study is concerned with overall fund-raising performance, the distinction between gifts for capital or current operating purposes was ignored. Similarly, the presence or absence of capital campaigns was ingored. It should be noted that CFAE reports show cash receipts only, with the result that campaign pledges (which can accumulate impressively during a drive) are smoothed by being reported only when paid.

Trends in fund-raising performance were determined with a time-series regression analysis for each institution for the eleven years from 1972 to 1982. Regressions were calculated only for variables reported at least six times during that period. For each variable, the regression provided a slope and intercept. The intercept term is not very informative, but the slope from each regression equation is equivalent to an estimated annual increase in the value of the variable. The slope thus gives a measure of the gross rate of increase. To measure the relative magnitude of that increase, the slope value was divided by the 1972 starting absolute value.

This procedure produced eight rankings of achievement: the 1972 and 1982 rankings on total private support, private support leverage, average alumni gifts, and alumni annual fund participation. Eight rankings of improvement were also produced: the absolute and the relative improvements during the period on each of those four measures. To provide summary gauges of fund-raising achievement and improvement, lists were compiled of the number of times each institution appeared among the top ten on the eight achievement and the eight improvement rankings.

The authors acknowledge with gratitude the work of M. Sherif Lotfi in computer manipulation of the data.

DISCUSSION

The four indices could, with some oversimplification, be characterized as follows: total private support is a measure of overall absolute achievement; private support leverage is a measure of the importance of private support to an institution; alumni participation is a measure of alumni loyalty; and average alumni gift is a mixed measure of alumni loyalty and alumni wealth.

The major research universities tend to dominate the rankings for total private support at both the beginning and end of the period (Table 2.) Given the magnitude of the dollars involved, their year-to-year absolute improvements are also dominant. A number of smaller institutions registered larger percentage gains, however.

The colleges, which in the absence of professional schools and large research rely on private support for a large share of their budget, tend to dominate the rankings for private support leverage (Table 3.) Dartmouth is the only institution appearing in the top ten on both achievement indicators. Brandeis' figure for 1972 reflects an institution still in start-up but which received extraordinary private support.

Given the dollar gains shown in Table 2, one might expect that fund-raising covered as large a share of institutional budgets in 1982 as it did in 1972. Such is clearly not the case for the majority of institutions in this sample; the 1982 leverage figures are in most cases lower than they were in 1972.

Large and small institutions are mixed together on the average alumni gift index (Table 4.) Colleges dominate the top of the alumni annual fund participation index (Table 5), except for Dartmouth and Princeton, which appear in the top ten.

Princeton, Dartmouth, Bowdoin, Williams, Bryn Mawr, Smith, and Yale are institutions which are listed in the top ten in five or more of the eight indices of private support achievement (Table 6.) The institutions listed five or more times on the indices of improvement are Swarthmore, Tufts, Boston College, Hamilton, Washington University, and Union.

NEXT STEPS

There are several directions in which this research should proceed.

First, the performance analysis should be completed by obtaining the missing data elements from participating institutions, so all institutions can be viewed in all years.

Second, since institutional performance can vary dramatically within shorter periods, performance improvement trends might be sought over five-year periods. A danger in this approach is that reduction in the number of data points may reduce the significance of the trend lines derived.

Third, correlations could be sought between fund-raising achievement for each institution over this period and other institutional characteristics such as enrollment, operating budget size, endowment, number of alumni, and computed characteristics such as endowment per student, ratio of number of alumni to enrollment, and alumni participation. In an unpublished study of a smaller number of institutions, Dunn and Hutten found that total private support was significantly correlated with number of alumni and average gift size. Private support leverage was found to be significantly correlated with the percent of alumni contributing and average gift size. These findings were limited in their usefulness because that study included data for only two years; regression analysis on the data for a larger group of institutions for more years should yield better data.

Finally, research might well go beyond the CFAE data to look for relationships of giving patterns with institutional age, location, overall budget, alumni wealth, frequency of capital campaigns, methods of solicitation and other factors.

TABLE 1: COLLEGES AND UNIVERSITIES INCLUDED IN THE SAMPLE

Universities	Universities	Women's Colleges	Coed Colleges
Brandeis	Harvard	Bryn Mawr	Amherst
Boston College	Johns Hopkins	Mills	Bowdoin
Boston Univ.	M.I.T.	Mount Holyoke	Colby
Brown	Princeton	Smith	Grinnell
Columbia	Stanford	Wellesley	Hamilton
Cornell	Tufts		Haverford
Dartmouth	Washington Univ.		Swarthmore
Duke	Yale		Trinity
Emory			Union
Georgetown			Wesleyan
			Williams

TABLE 2: GRAND TOTAL PRIVATE SUPPORT
(Amounts in millions of dollars)

	Achievement				Improvement			
	1972		1982		Est. Ann. Incr., '72-'82 [1]			
Rank	Name	Am't	Name	Am't	Name	Am't	Name	%
1	Harvard	50.9	Harvard	181.0	Harvard	8.1	Tufts	40
2	Yale	35.2	Yale	82.2	Stanford	4.3	Hamilton	40
3	Stanford	29.5	Stanford	77.0	Yale	4.1	BC	37
4	Brandeis	27.8	Washington	57.2	MIT	3.4	Swarthmore	32
5	Cornell	21.4	Cornell	50.9	Hopkins	2.9	BU	30
6	Princeton	18.3	Columbia	50.6	Cornell	2.9	Mt Holyoke	30
7	Washington	16.8	Princeton	47.4	Dartmouth	2.6	Union	28
8	Dartmouth	15.2	MIT	46.6	Columbia	2.6	Hopkins	23
9	Emory	13.2	Hopkins	36.7	Princeton	2.6	Wellesley	22
10	Hopkins	12.5	Duke	33.2	Washington	2.3	Georgetown	21
11	Brown	6.9	Dartmouth	30.4	Duke	2.0	Dartmouth	17
12	Smith	6.8	Brown	19.1	Georgetown	1.2	Grinnell	17
13	Georgetown	5.8	Georgetown	16.5	Brown	1.1	Brown	17
14	Williams	4.1	Brandeis	14.6	Tufts	1.0	Harvard	16
15	Bowdoin	3.8	Smith	14.0	Smith	0.8	Stanford	15
16	Bryn Mawr	3.5	Emory	13.2	Wellesley	0.7	Washington	14
17	Wellesley	3.2	Tufts	13.0	BU	0.7	Princeton	14
18	Tufts	2.5	BU	12.2	Wesleyan	0.6	Colby	14
19	BU	2.3	Amherst	9.2	Mt Holyoke	0.5	Cornell	13
20	Haverford	2.0	Wellesley	8.9	Bryn Mawr	0.5	Bryn Mawr	13
21	Mt. Holyoke	1.6	Williams	7.8	BC	0.4	Smith	12
22	Swarthmore	1.3	Bryn Mawr	7.6	Swarthmore	0.4	Yale	12
23	Union	1.3	Wesleyan	5.7	Union	0.4	Haverford	8
24	BC	1.2	Mt. Holyoke	5.6	Hamilton	0.3	Williams	8
25	Grinnell	1.1	BC	5.4	Williams	0.3	Brandeis	-2
26	Colby	1.1	Union	5.1	Grinnell	0.2	Emory	-2
27	Hamilton	0.9	Bowdoin	4.8	Haverford	0.2		
28			Haverford	4.4	Colby	0.1		
29			Hamilton	4.4	Trinity	0.1		
30			Swarthmore	4.3	Mills	0.1		
31			Grinnell	3.6	Bowdoin	0.0		
32			Colby	3.3	Emory	-0.3		
33			Trinity	2.9	Brandeis	-0.4		
34			Mills	2.2				

1. The first "improvement" column plots the slope of the regression for the 11 years from 1972 to 1982, for all institutions reporting in at least six years. The second column approximates an annual percentage change by dividing the slope by the 1972 absolute value.

TABLE 3: PRIVATE SUPPORT LEVERAGE
(Total private support / educational and general expenditures)

	Achievement				Improvement			
	1972		1982		Est. Ann. Incr., '72-'82 [1]			
Rank	Name	%	Name	%	Name	%	Name	%
1	Brandeis	169	Amherst	43	Wesleyan	1.6	Tufts	6.3
2	Bowdoin	73	Princeton	38	Swarthmore	1.2	BC	6.0
3	Smith	63	Haverford	37	Princeton	0.6	Swarthmore	4.8
4	Dartmouth	62	Bryn Mawr	37	Tufts	0.5	Princeton	2.0
5	Williams	59	Smith	33	Mt Holyoke	0.4	Mt Holyoke	1.4
6	Haverford	58	Williams	33	BC	0.3	Union	0.6
7	Bryn Mawr	55	Dartmouth	33	Union	0.1	Hamilton	0.0
8	Wellesley	45	Brandeis	31	Hamilton	0.0	Brown	0.0
9	Yale	37	Wellesley	30	Brown	0.0	Hopkins	-0.6
10	Princeton	30	Bowdoin	29	Hopkins	-0.1	Dartmouth	-0.8
11	Mt. Holyoke	29	Yale	28	BU	-0.2	Georgetown	-1.0
12	Washington	28	Mt. Holyoke	27	Georgetown	-0.2	Yale	-1.1
13	Grinnell	27	Grinnell	27	Columbia	-0.2	Cornell	-1.2
14	Hamilton	26	Washington	26	Cornell	-0.2	Wellesley	-1.8
15	Swathmore	25	Swarthmore	26	Duke	-0.2	Colby	-1.8
16	Emory	25	Hamilton	25	Yale	-0.4	Bryn Mawr	-2.0
17	Brown	24	Union	25	Colby	-0.4	Washington	-2.1
18	Colby	22	Colby	24	Dartmouth	-0.5	Stanford	-2.7
19	Stanford	22	Stanford	19	Washington	-0.6	Smith	-2.9
20	Union	20	Mills	18	Stanford	-0.6	Haverford	-3.4
21	Georgetown	20	Duke	18	MIT	-0.7	Grinnell	-4.4
22	Hopkins	18	Trinity	18	Wellesley	-0.8	Williams	-4.6
23	Cornell	17	Wesleyan	17	Bryn Mawr	-1.1	BU	-5.0
24	Tufts	8	Georgetown	15	Trinity	-1.1	Brandeis	-5.2
25	BC	5	Hopkins	14	Grinnell	-1.2	Bowdoin	-5.6
26	BU	4	MIT	14	Smith	-1.8	Emory	-8.8
27			Tufts	14	Haverford	-2.0		
28			Columbia	13	Emory	-2.2		
29			Emory	13	Williams	-2.7		
30			BU	6	Mills	-3.6		
31			BC	5	Bowdoin	-4.1		
32					Brandeis	-8.8		

1. The first "improvement" column plots the slope of the regression for the 11 years from 1972 to 1982, for all institutions reporting in at least six years. The second column approximates an annual percentage change by dividing the slope by the 1972 absolute value.

TABLE 4: AVERAGE ALUMNI GIFT

(Total dollars from alumni / total alumni of record)

	Achievement				Improvement			
	1972		1982		Est. Ann. Incr., '72-'82[1]			
Rank	Name	$	Name	$	Name	$	Name	%
1	Dartmouth	354	Washington	611	Dartmouth	38	Washington	48
2	Haverford	334	Yale	504	Washington	27	Grinnell	48
3	Bryn Mawr	293	Princeton	478	Swarthmore	23	Swarthmore	32
4	Princeton	263	Harvard	477	Princeton	22	Hamilton	27
5	Yale	241	Amherst	393	Yale	19	BU	25
6	Williams	206	Dartmouth	386	Hamilton	19	Colby	24
7	Smith	166	Bryn Mawr	333	Wellesley	15	Mt Holyoke	22
8	Bowdoin	135	Smith	285	Mills	12	Hopkins	19
9	Harvard	121	Williams	276	Smith	14	Wellesley	18
10	Brown	97	Bowdoin	273	Wesleyan	12	Tufts	17
11	Wellesley	85	Swarthmore	230	Mt Holyoke	11	BC	13
12	Cornell	81	Wellesley	205	Grinnell	11	Union	13
13	Stanford	74	Haverford	190	Bowdoin	11	Dartmouth	11
14	Swarthmore	72	Brown	183	Brown	9	Brown	9
15	Hamilton	71	Mt Holyoke	177	Hopkins	7	Princeton	8
16	Washington	56	Hamilton	153	Colby	7	Smith	8
17	Georgetown	58	Wesleyan	139	Union	7	Bowdoin	8
18	Union	56	Stanford	123	Stanford	6	Stanford	8
19	Mt Holyoke	50	Hopkins	123	Columbia	6	Yale	8
20	Hopkins	37	MIT	112	Tufts	5	Cornell	4
21	Colby	29	Cornell	105	Brandeis	3	Emory	4
22	Tufts	29	Grinnell	105	Cornell	3	Georgetown	2
23	Emory	28	Colby	105	BC	2	Williams	0
24	Grinnell	23	Union	97	Duke	2	Bryn Mawr	-1
25	BC	15	Trinity	88	Georgetown	1	Haverford	-5
26	BU	4	Mills	86	Emory	1		
27			Tufts	85	BU	1		
28			Columbia	80	Williams	0		
29			Duke	66	MIT	-2		
30			Georgetown	46	Bryn Mawr	-2		
31			Emory	38	Trinity	-3		
32			Brandeis	31	Haverford	-15		
33			BC	29				
34			BU	21				

1. The first "improvement" column plots the slope of the regression for the 11 years from 1972 to 1982, for all institutions reporting in at least six years. The second column approximates an annual percentage change by dividing the slope by the 1972 absolute value.

TABLE 5: ALUMNI ANNUAL FUND PARTICIPATION
(Alumni donors to annual fund / total alumni of record)

	Achievement				Improvement			
	1972		1982		Est. Ann. Incr., '72-82 [1]			
Rank	Name	%	Name	%	Name	%	Name	%
1	Dartmouth	58	Williams	63	Washington	1.4	BC	8.9
2	Williams	55	Dartmouth	59	Tufts	1.2	BU	8.9
3	Mt Holyoke	52	Amherst	53	Union	1.2	Washington	7.8
4	Hamilton	52	Bowdoin	51	Williams	1.1	Grinnell	6.0
5	Princeton	50	Union	51	Wesleyan	1.0	Tufts	4.6
6	Bowdoin	46	Swarthmore	48	Grinnell	0.9	Georgetown	4.0
7	Haverford	47	Wesleyan	46	Georgetown	0.8	Stanford	3.9
8	Smith	44	Wellesley	46	BC	0.8	Union	3.2
9	Bryn Mawr	42	Princeton	44	BU	0.8	Williams	2.0
10	Swarthmore	41	Mt Holyoke	43	Stanford	0.7	Emory	1.9
11	Yale	39	Haverford	40	Swarthmore	0.6	Swarthmore	1.5
12	Union	37	Smith	39	MIT	0.5	Brown	1.5
13	Hopkins	30	Hamilton	38	Yale	0.4	Yale	1.0
14	Colby	29	Yale	37	Emory	0.4	Dartmouth	0.7
15	Brown	27	Mills	35	Dartmouth	0.4	Bowdoin	0.7
16	Tufts	26	Brown	34	Brown	0.4	Colby	0.0
17	Harvard	25	MIT	33	Bowdoin	0.3	Cornell	-0.5
18	Emory	21	Tufts	33	Trinity	0.2	Smith	-0.9
19	Cornell	20	Bryn Mawr	32	Brandeis	0.0	Princeton	-1.2
20	Georgetown	20	Trinity	30	Colby	0.0	Mt Holyoke	-1.5
21	Washington	18	Colby	30	Mills	-0.1	Hopkins	-1.7
22	Stanford	18	Emory	26	Cornell	-0.1	Bryn Mawr	-2.1
23	Grinnell	15	Georgetown	26	Smith	-0.4	Harvard	-2.4
24	BU	9	Stanford	25	Wellesley	-0.3	Haverford	-2.5
25	BC	9	Columbia	25	Hopkins	-0.5	Hamilton	-2.7
26			Washington	24	Harvard	-0.6		
27			Grinnell	23	Princeton	-0.6		
28			Brandeis	23	Duke	-0.7		
29			Duke	22	Mt Holyoke	-0.8		
30			Cornell	20	Bryn Mawr	-0.9		
31			Hopkins	20	Haverford	-1.2		
32			BC	19	Hamilton	-1.4		
33			BU	16				
34			Harvard	14				

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1. The first "improvement" column plots the slope of the regression for the 11 years from 1972 to 1982, for all institutions reporting in at least six years. The second column approximates an annual percentage change by dividing the slope by the 1972 absolute value.

TABLE 6: LEADERS IN ACHIEVEMENT AND IN IMPROVEMENT

Achievement	
Name	Freq.[1]
Princeton	8
Dartmouth	7
Bowdoin	6
Williams	6
Bryn Mawr	5
Smith	5
Yale	5
Harvard	4
Haverford	4
Amherst	3
Brandeis	3
Cornell	3
Johns Hopkins	3
Washington University	3
Wellesley	3
Mount Holyoke	2
Stanford	2
Swarthmore	2
Brown	1
Columbia	1
Duke	1
Emory	1
Hamilton	1
M.I.T.	1
Union	1
Wesleyan	1

Improvement	
Name	Freq.[1]
Swarthmore	7
Tufts	6
Boston College	5
Hamilton	5
Union	5
Washington University	5
Johns Hopkins	4
Mount Holyoke	4
Princeton	4
Dartmouth	3
Georgetown	3
Grinnell	3
Stanford	3
Wellesley	3
Wesleyan	3
Boston University	2
Brown	2
Williams	2
Yale	2
Colby	1
Columbia	1
Cornell	1
Emory	1
Harvard	1
Mills	1
M.I.T.	1
Smith	1

1. Number of times the institution is listed among the top ten in the eight indicators of performance or in the eight indicators of improvement.

THE IMPACT OF MARKET FORCES ON INSTITUTIONAL DECISION MAKING IN A TIME OF TURBULENCE FOR HIGHER EDUCATION

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INTRODUCTION

Academia is often perceived as unchanging, traditional and cautious. A study of degree granting patterns over the past twenty years and their concomitant enrollment patterns would quickly dispel the accuracy of such perceptions and paint a somewhat different picture (Hester, 1982). Institutions are caught up in enormous change, and are adapting in some ways very quickly to the turbulent environment. My thesis is that colleges are reacting very energetically to market forces at the level of program provision. There is an enormous scramble to provide business courses and computer courses, as well as other courses in high demand. The problem with this situation is that education may be reduced to responding to popular demand, and lose touch with its historic mission to pass on values and the essence of our culture.

VALUES IN DECISION MAKING

I believe that values are central to the mission of higher education, yet values can never be constant in a changing world. There is, therefore, a resulting challenge to leadership. Indeed the task of leadership is to reframe values in the present and give values contemporary meaning in the process of decision making. Thus, I argue, decision making must go beyond interpreting data. It must reinterpret an institution's present mission, and this task must take account of educational values. In a turbulent environment this is no easy undertaking. The failure to respect values robs an institution of its character and will surely set in motion a process of institutional decay.

In the past twenty years things have changed a great deal on the campus. From being concerned with the burning social questions of the day, or ones of personal meaning, students have moved to concerns for a job and how much can be earned. An instructive example of change on the campus is to review the books holding the number one best-seller position (Chronicle of Higher Education, 1983). Presently the position is occupied by In Search of Excellence, a study of what can be learned from the best run American companies. The authors link excellence and values. Leadership is critical, and it is essential to respect people. Thomas J. Peters and Robert H. Waterman (1982) summarize and simplify their findings into the "McKinsey 7-S Framework" of seven interacting variables (see figure 1). They contrast this with the ineffective "New Product Sign-off" model for a new company that buries itself in complexity (see figure 2). Leadership and organizational effectiveness are a blend, according to Peters and Waterman, of strategy, structure, systems, skills, style, staff and, at the core, shared values. They go further and suggest;

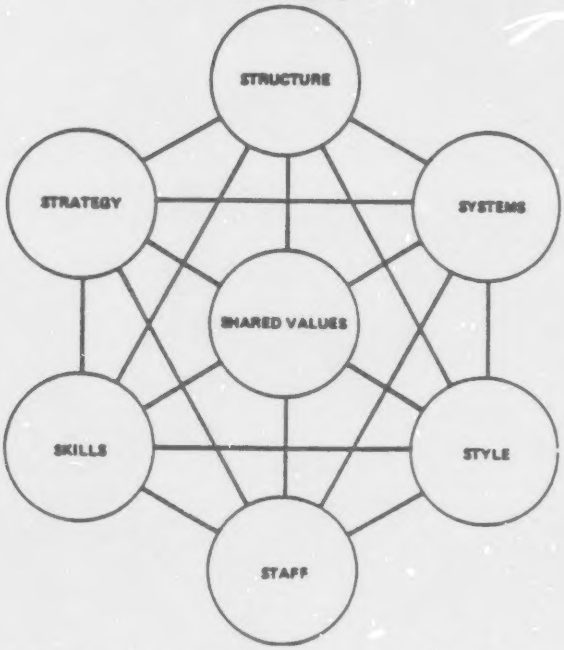
> The role of the chief executive is to manage the values of the organization . . . what values ought to be shaped and managed, and that we will then have helped to solve the leadership dilemma after all.(p.26)

It is reasonable to suggest that higher education institutions will similarly exhibit the same qualities, and that we as researchers cannot avoid the issue of values, for values are central to effective leadership.

Patrick Terenzini (1980) has suggested that:

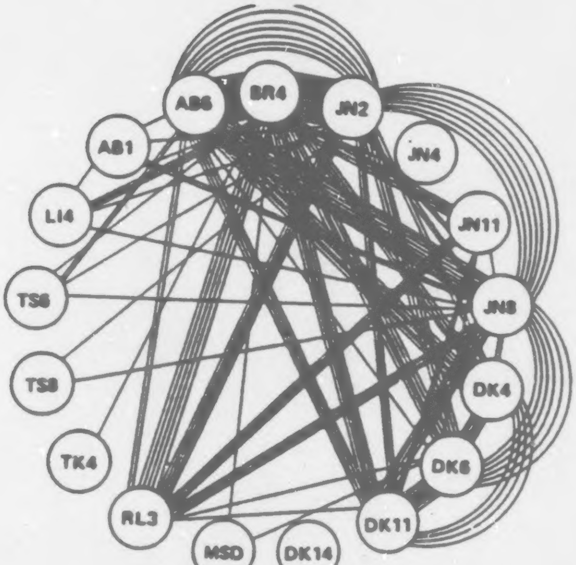
> Institutional research has reached the stage of development where it is necessary to move beyond "How many . . .?" type questions to ones not so easily answered, ones that are of a higher order. These questions are about the worth, value, benefit and quality of the program, service or activity being considered.(p.81)

FIGURE 1


STRUCTURE
STRATEGY
SYSTEMS
SHARED VALUES
SKILLS
STYLE
STAFF

MCKINSEY 7-S FRAMEWORK: MODEL OF INTERACTING VARIABLES IN EFFECTIVE MANAGEMENT

FIGURE 2


AB5
BR4
JN2
AB1
JN4
LI4
JN11
TS6
JN8
TS8
DK4
TK4
DK6
RL3
DK11
MSD
DK14

NEW PRODUCT SIGN-OFF MODEL FOR NEW PRODUCT DEVELOPMENT

SOURCE: Peters, Thomas J. and Waterman Jr., Robert H., In Search of Excellence. New York: Harper and Row, Publishers, 1982.

But, as Edward Hines (1980,p.105) noted, it is easy for us to get trapped into thinking that merit is a unitary concept, or for us to overlook the distinctions that Y.S. Lincoln and E.G. Guba (1980) make of value in context. Higher education adapts very rapidly to changes in program demand; however,values and traditions tend to develop much more slowly. I wish to suggest that part of the purpose of education is, and should be, construed in terms of value formation. It may not, however, be clearly understood how value development is affected by the play of market forces upon the system. These two dimensions are not independent of one another. There is, I suggest, an ongoing interaction between values and market influences, and, therefore, modification or development of values over time. Values antecede the present context, but are reinforced, modified, developed and adapted, and in times of transition even changed by actions in the present. Higher education values are context conditioned and take shape in an extended process spanning many generations.

On what basis do we construct our perspective as researchers? How well should we understand the driving forces which shape higher education? The study of these forces will eventually raise questions of contrasting value: the liberal education of the mind versus a narrow vocationalism. The flexibility of higher educational institutions can be clearly seen in the rapid development of business education by well known liberal arts colleges, where in some cases such courses now constitute forty percent of the contact time.

THE DEVELOPMENT OF AMERICAN HIGHER EDUCATION

Hugh Hawkins (1980) in his keynote address to our 1980 conference contended that:

> The central purpose (of higher education) has been continuous, and I name it once more: The increase of knowledge and the decrease of ignorance.(p.17)

In pursuit of this purpose, he further insisted:

> The greatest strength of our colleges and universities has been their flexibility. And their greatest weakness has been . . . the same thing.(p.2)

As a historian he was well qualified to provide the conference with a graphic overview of the history of higher education.

Although American higher education has its roots in Europe, it has developed very differently from those early influences (Ben-David, 1972). In Europe,until very recently, there has been a remarkable stability in the structure and respective sizes of the component parts. Program areas have remained proportionally constant over time. In the United States, however, there has been almost continuous change. In the United States higher education is a decentralized system, with colleges and universities enjoying considerable autonomy. Ben-David (1982) suggests the system works on the basis of enterprise, competition and cooperation. I have suggested that these fundamental mechanisms are consistent with and derived from the environment (Hester, 1983). I further suggested that such an analysis is consistent with "Open-System Theory". The researcher should, therefore, take account of the whole development process.

It is important to have a sense of the historical perspective, and to understand how values were brought to the new world from Europe. It is also important to understand how these values have been modified and mixed with other values that reflect the uniquely individualistic culture of America.

Friedrich Rudolph (1962) has provided us with a comprehensive history of the American college. Ben-David (1972) draws a sociological/historical perspective with an emphasis on process I find very helpful to the researcher who is constructing frames of reference. Hawkins' summary (1980), however, is a good starting point for gaining a sense of history and an idea of what to avoid, or as he states:

> In short, I see universities as often teetering between a self satisfied, narrow intellecturism and a surrender to external powers.(p.3)

Hawkins (1980) identifies four key actors, two major pieces of legislation, a couple of controversies, the great depression, and two world wars as major influences in the shaping of American higher education. Ben-David's (1977) account is remarkably similar. It is an exciting story. In the space of little over one hundred years the system has expanded from three hundred small colleges serving less than one hundred thousand students, and only teaching mathematics and classics, to the highly diverse, decentralized organization we know today. It now serves twelve million people from every conceivable background, in settings from small campuses to what Clark Kerr calls the multiversity. In New York state alone there are over fifteen thousand programs in two hundred and fourty nine institutions.

It is important to ask the question why Ezra Cornell was able to create a university which offered "instruction in anything" or why Charles W. Elliott, the first non-clergy president at Harvard, could reform a traditional school with his elective system and vitalization of its professional schools; or Daniel Coit Gilman, at John Hopkins, could lead the way to graduate education as we now know it. While all this was going on William Rainey Harper established the reputation of the University of Chicago with its emphasis on curricular inclusiveness, advanced study, research oriented faculty, professional schools, faculty ranking system, and an administrative structure to hold it all together. The key is surely in what Hawkins identified as flexibilty, which in turn is the product of the new burgeoning society which I have characterized in the "Mayflower Vector Theory", with its associated market mechanism to account for the dynamic quality of our educational system (Hester, 1983).

Hawkins suggested that the Civil War released a spirit of nationalism and liberalism, a birth aided by the resources created by the newly emerging industrial society. Ezra Cornell was not alone. He and others like him were helped by the provision of the Morril Land Grant act of 1862. History was to repeat itself nearly one hundred years later in the post-war G.I. Bill: a bill which has had a lasting effect in establishing open access to higher education, and with it the rise of the community college system. It is a story of entrepreneurship, adventure, dynamic activity, philanthropy, and public contribution. It has created in the space of a century a system which is uniquely American and unlike anything anywhere else in the world, although it still bears the marks of its roots. Ben-David (1972) distinguished it from others by its size, comprehensiveness, diversification, differentiation, standardization and integration. American higher education derives and is itself an expression of the vitality of American culture, a culture which blends competition, cooperation, and high ideals; a country of enormous pragmatism and billowing dreams. America is an enormously active market place, a land of opportunity, a country where there are always new frontiers. Our colleges have been shaped in this dynamic environment.

MARKET FORCES HAVE SHAPED HIGHER EDUCATION

Higher education is much more influenced by market forces than many people suppose. System-wide approaches to planning, if they are not to be out of place with the environment, must clarify how seemingly independent institutions in fact are part of a whole. By combining open system analysis with the market mechanism and the "Mayflower Vector Theory", which I describe elsewhere (1983), the way is open to a more adequate understanding of how higher education functions in America. It is suggested that theories of organic structure are much more appropriate and descriptive than bureaucratic ones.

Ben-David (1972) considered that American higher education was founded upon the acceptance of enterprise, competition and cooperation as foundations of society. I have suggested that higher education can, therefore, best be understood as functioning as a market system where the students are buying a product - a degree - in order to gain access to more desirable employment. My study has shown that, in New York State, students exhibit markedly different purchasing patterns over time. Ben-David (1972) also expressed the opinion that the system of higher education is able to function because of differentiation, standardization, diversification and integration. By this, he meant the clear recognition of degree levels, variety of program offerings, transferability, and upward mobility in the system. It seems that the purchaser exhibits a great deal of flexibility in choice of product, and has exercised it dramatically since 1960. Degree structures, however, have remained differentiated and program areas opened to accomodate new needs. The simple, clearly differentiated degree structure may have aided the rapid growth and changes that have taken place. This structure may have provided the framework by which acceptable standards are preserved.

The Carnegie Report Three Thousand Futures (1980) argued that each institution was likely to find an individual path through the years ahead, as response is made to the challenges that are developing and so it becomes appropriate to consider planning in the educational context.

Higher education sells a product, a degree, which varies considerably in price, and colleges compete with one another in the market place.

VALUES, GOALS AND CULTURE

The 1860's was a time of major transition. The old pious ideals, centered around the notion of the pious, righteous, educated gentleman, gave way to the new secularism (Ben-David, 1972; Rudolph, 1962). The secularism has been born along on the industrial era with its attendant commercialism. My argument is that values influence the change process, for example they affect demand, but values themselves change because of the dynamic nature of the interaction.

Abraham Maslow (1964) developed the conceptualization of a hierarchy of motivation, and that higher order expectations of the self depend on lower or more basic levels of need being satisfied first. I believe this concept can be applied to groups. When a group or society satisfies its basic needs to a functional level, it is free to develop notions of group actualization. Out of the process of satisfying, values are formed which help build the culture and thereby create a means of continuity. The continuity gives purpose to life. Symbolic expressions of the ideals and values reinforce the continuity.

A much earlier idea than Maslow's was that of Simeon N. Patten (1899) who suggested the idea of a thought curve (see figure 3). A thought pattern takes an extended period of time to develop. A culture, Patten argues, is made up of economic, aesthetic, moral and religious ideas. Each curve grows from its own economic roots, but a blending with the past takes place once the new economic framework has taken hold. In this way a pendulum effect may at times be detected. New ideas very rarely take hold in their entirety. The dominant cultural thought wave both

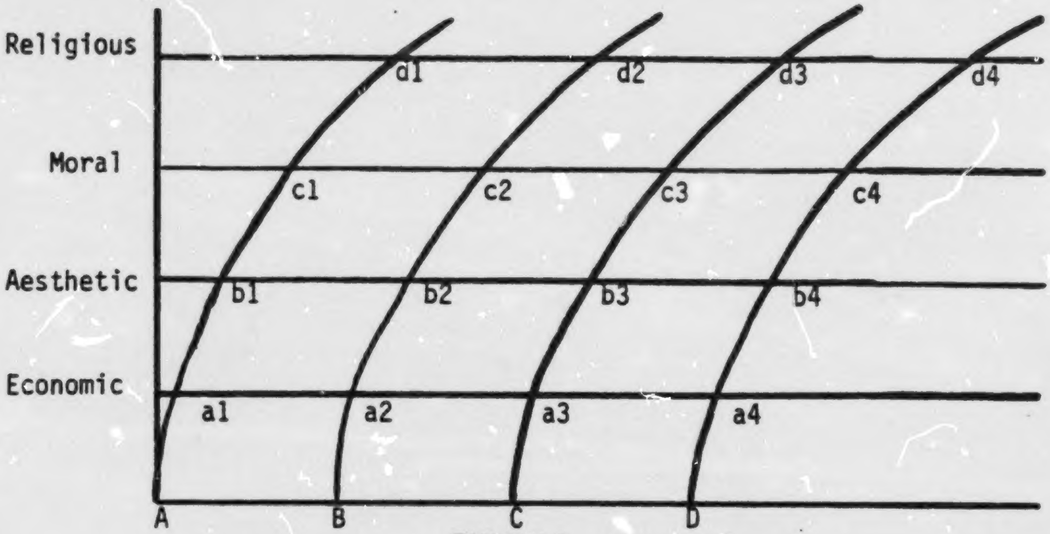


FIGURE 3
THOUGHT CURVE DEVELOPMENT
OVER TIME

Source: Patten, Simeon N., The Development of English Thought, 1899.

modifies and is modified with the passage of time, this is especially so when economic conditions change. America with its individualism, frontierism and work ethic, has a set of values vastly different from a culture such as that of China or Russia. Similarly an educational institution, if it is to survive, needs and will develop a set of values. In order for the institution to survive its particular set of values must reflect those of society or a niche within society. Decision making, I therefore hold, should never be confined to rationalistic or objective criteria. The task of leadership is complex, and it is not value-free. Decisions that are successful in implementation respect old values, while they add a dimension essential to the future.

VALUES IN A TIME OF TURBULENCE

The work of Forrester (1971) and Zeeman (1980) can be utilized to develop a model for integrating the role of values in decision making in a time of rapid change. If change between variables becomes discontinuous then collapse becomes possible. Similarly, if the economic structure changes very quickly then the aesthetic, moral and religious order is undermined. Since education is the vehicle for conveying much of these ideas from one generation to the next, it follows that institutions can be thrown into the turbulence that ensues. Figure 4 presents the conflict of values in the "Zeeman Catastrophe Theory" context. The task

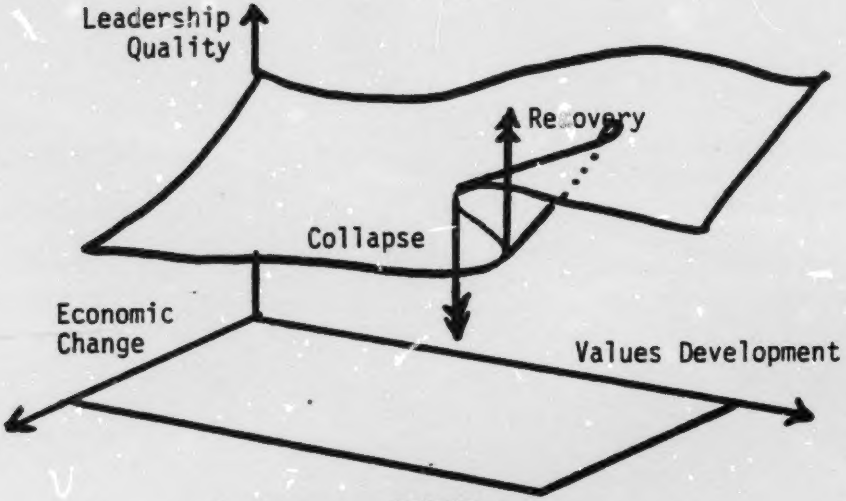


FIGURE 4
APPLICATION OF ZEEMAN'S CATASTROPHE THEORY:
A MODEL OF LEADERSHIP, ECONOMIC CHANGE,
AND VALUES INTERACTION

Source: Zeeman,E.C., Meeting the Challenges of the Eighties, 1980.

of leadership is, if possible, to avoid the "cusp" situation via successful adaptation. This means managing changing values in relation to economic change and decision making. Much of the crisis in classroom teaching would have been avoided if the value of education had been more respected during the past decade. Our society faces an economic upheaval on a level as great as the change that occured one hundred years ago, as society moved from an agricultural to an industrial society. We are moving rapidly to the information society with all its advanced technology and attendant social change.

CONCLUSION

Higher education does have the responsibility of transmitting our culture and its values to the next generation. It is highly responsive to programatic demands on the part of its young students. A strong music, language, or educational department takes decades to build, and it is all to easy to wipe out such programs because of a budget emergency and low demand. Curricular issues, personnel policy, human services and plant decisions can all raise, and I think should raise, questions of values and ideals. Our predecessors were conscious of the future, we need to be too. We are living in a time when there is uncertainty over values, a time when they are easily sacrificed. Vision is necessary to discover new directions.

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THE USE OF SPSS IN IDENTIFYING BUDGET ISSUES AND THEIR MAGNITUDE

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A COMMON, CRITICAL FACTOR

While any one of several crucial aspects of higher education could be studied, all public post-secondary education eventually converges at one common point: funding and the external agencies which recommend, award, administer and audit these monies. If all resources available to the State University of New York (SUNY) and its students were considered, the number of fiscally-related external agencies would indeed be large. They would include not only New York State (NYS) but the federal government, foundations, corporations, businesses, individuals, etc. Although public colleges are now being encouraged to more extensively study and cultivate all sources of support, the scope of this project has been limited to one aspect of current investigations into possible change to the formula budget for higher education used by the NYS Division of the Budget (DOB).

It is important to recognize that the major source of operating funds for SUNY is still the State budget process. Since DOB is staff to the governor in the preparation of the Executive Budget and later executes the budget as adopted by the Legislature, the University is very much affected by Budget's operating practices, procedures, formulas and foci. Several issues concerning possible revisions to funding procedures and formulas have been the subject of discussion between SUNY and DOB for some time now. While somewhat oversimplified, the University has proposed returning to a student credit hour based measure of instructional workload that would be a chief component in DOB's formula budget and faculty lines model.

A review of the literature indicates that such a development is not unusual as many states have experienced periods of reexamination, revision and modification of the methods used to budget funds to higher education. The need for evolution is influenced by several things including perceived problems with the existing method, crises in higher education, recommendations of state-wide commissions, legislative studies and/or developments in other states. Much material and several case studies were researched and shed some light on the causal factors behind higher education budget modifications in the states of California, Florida, Georgia, Hawaii, Idaho, Michigan, Virginia, Washington and Wisconsin. As noted by a former chief budget examiner, a significant factor behind the present investigations of SUNY and DOB into a revised approach has been problems with the current as well as previous approaches:

> . . . Our aim was to devise a methodology for budgeting purposes that would most accurately reflect faculty teaching load, avoiding the aspects of the former FTE methodology that caused us to change to the current E.S. methodology and eliminating aspects of the E.S. methodology that may in other ways distort faculty workload. (Veillette, 1981, p. 1)

Inasmuch as SUNY is the largest system of public higher education in the United States, modifications or changes to DOB's budget formula and model may be of interest to a wide audience. Potentially, such change or redirection may influence not only SUNY but other institutions of public higher education. This potential is based upon the fact that over time states borrow or incorporate from one another budget techniques, formulas, models and approaches. The literature attests to this. Revised budget practices and procedures employed by DOB become part of the public domain through publication of the Executive Budget, delivery and publication of professional papers, correspondence and conversations between budget analysts. Thus, possible change in New York's higher education budget formula hypothetically may have far reaching consequences. As support staff to executive management, we have had the opportunity to contribute to and influence an investigative process that could have important ramifications.

What may be of most interest to institutional research staff is the approach utilized by SUNY Central Administration in conducting research and accumulating information to respond to various questions and requests of DOB. The University had to marshal new resources and draw upon the research, analytic and data collection talents of its Central Office of Institutional Research. As will be seen by the following pages, in utilizing a well established, system-wide data base together with SPSS, we contributed to a more informed and aware environment. SPSS enabled us to produce interim management reports and complete preliminary analyses of a proposed new approach for measuring faculty instructional workload.

EVOLUTION OF THE FUNDING FORMULA

Through fiscal 1976-77, Executive Budget recommendations for SUNY drew upon a formula that incorporated counts of full-time equivalent (FTE) students. These FTE's were in turn based upon the number of student credit hours (SCRH) for which students were registered. For some time now, Budget has been raising the issue of how State University institutions award course credit hours. Commencing with the Executive Budget for 1977-78, the governor's office through DOB developed and implemented a new workload methodology to use in the formula for allocating operating funds and faculty lines to SUNY. Whereas budgeted full-time equivalent (FTE) students for 1977-78 amounted to 165,506, the new equated student (ES) methodology produced a count of only 154,397--a decrease of 7 percent in the formula workload base.

In instituting the ES methodology, Budget gave equal weight to every full-time student regardless of actual student credit hour load. They also attempted to establish a specific relationship between the institution's full-time students and their part-time students. Consider the consequences of the following example of SCRH loads of full and part-time students at a sample college and the resulting FTEs versus ES counts:

Status	Headcount	Average SCRH Load	Total SCRH	FTE Workload	Equated Student (ES) Factor	Equated Student (ES) Workload Count
Full-time	2,229	17.59	39,208	2,614	1.00	2,229
Part-time	219	4.16	911	61	.2369	52
Total	2,448		40,119	2,675		2,281

The ES factor for part-time students was calculated from the relationship of average SCRH for part-time students to those of full-time students (4.16 divided by 17.59 produces a quotient of .2369). When applied to their respective headcounts, the ES approach yields approximately 15 percent less than the 2,675 count that would have been generated through an FTE approach.

Although the ES formula used by DOB has increased SUNY's administrative workload and has cost some institutions faculty lines, past practice will not be scrutinized in this paper. The thrust of the present inquiry is on the use of SPSS in analyzing the alternative workload approach being explored between Budget and the University. Many discussions and meetings have taken place since work on this issue began in March 1981. While the faculty workload proposal consists of several elements, the one most relevant to this inquiry is that concerning SCRH and faculty contact hours.

Budget wishes to examine credit-to-contact hour relationships from both a student and faculty perspective. They wish to explore a method whereby student credits awarded in excess of faculty contact hours might be adjusted. This is a new development for higher education in New York State. In addition, this constitutes a policy issue which has not been specifically addressed by external authoritative educational bodies whose rules, regulations and recommendations seem to be directed to just required student contact hours. DOB is firm on this issue, however, and has stated:

> We cannot accept student credit hours as a basis for workload measurement without this feature . . . although the credits awarded in excess of faculty contact hours may be academically sound and fully in compliance with the University's guidelines, they are nevertheless a measure of student effort and achievement not necessarily of faculty workload, since they are not coincident with faculty contact periods. (Fawcett, 1982, p.2)

It has been well documented how student credit hours are used in measuring progress towards a degree or other formal award and are nationally recognized within higher education. Along with other authorities, Sidney Suslow has noted the use of SCRH as a surrogate for faculty workload and for budgeting funds to colleges. Promotion of a student credit hour based methodology by SUNY thus appears to have a sound basis and historical precedent. The student portion of Budget's investigation into the relationship between SCRH and contact hours also appears to have a sound basis and historical precedent. The New York State Education Department has promulgated rules and regulations which appear to relate specifically to the relationship between contact hours and student credit hours. Parts 50 and 52 of the Commissioner's regulations bear special relevance to the study:

> (o) Semester hour means a credit, point, or other unit granted for the satisfactory completion of a course which requires at least 15 hours (of 50 minutes each) of instruction and at least 30 hours of supplementary assignments . . . This basic measure shall be adjusted proportionately to translate the value of other academic calendars . . (October 1980, p. 42)
>
> (4) A semester hour of credit may be granted by an institution for fewer hours of instruction and study . . .
> (i) when approved by the commissioner as part of a registered curriculum; or
> (ii) when the commissioner has granted prior approval for the institution to maintain a statement of academic standards that defines the considerations which establish equivalency of instruction and study . . . (April 1980, p. 47)

Inasmuch as all active academic programs at SUNY institutions have been approved and registered by SED, this appears to constitute de facto acceptance of the instructional patterns employed by our colleges. As can be seen by the foregoing quotation from the budget examiner's letter, the issue of acceptance by authoritative educational bodies and concept of academic soundness have been judged irrelevant by DOB to the present investigations into a revised faculty instructional workload approach.

It must be stressed that this focus by DOB on credit hours and faculty contact hours is still being reviewed by SUNY's Office of the Provost and the Doctoral Council. Since the University has not yet officially responded to Budget on that aspect of the proposed workload methodology, incorporation of a position statement in this paper would not now be appropriate. Many activities particular to the practice of institutional research have transpired, however, and these are described in the following sections.

UNIVERSITY INITIATIVES AND RESEARCH

Recognizing the importance of the credit-to-contact hour issue to the funding formula and faculty lines model, the Associate Vice Chancellor for Institutional Research and Planning assigned his staff the project of researching, projecting, and producing detailed plus summary reports showing what degree of compliance would exist for each institution if contact hour criteria were applied to faculty. For the past six years, campuses have routinely received exception reports (CASA-89 by department and CASA-WSCOH by discipline group) showing courses which did not appear to meet the criteria from a student contact hour perspective. Never before had the need existed to overlay on faculty contact hours the rules and regulations of SED and SUNY which had been implemented to address required student effort.

Computer resources were secured and a new series of reports developed which examined "faculty course contact hours versus faculty course credit hours". The first stage of this multiphase project was completed in about eight weeks--a relatively short time for projects analyzed and programmed from a cobol approach. Part of the project required calculating faculty course credits by level of instruction, responsible academic unit and instruction type. This was necessary to apply all relevant portions of the SUNY policy which has different contact hour requirements depending on the type of instruction. It was also needed to facilitate determination of responsibility and to determine which components (specific courses, particular levels of instruction, certain instruction types, etc.) might be contributing to any problems that might exist. Complex algorithms were required to deal with multitudinous differences such as courses with different credit hour values, team taught courses, shared resource courses, etc.

Upon analyzing the information contained in the new reports, we discovered that while they were useful for internal review and utilization, the reports could not be used in responding to DOE. The major item which skewed the data for budget purposes was tutorial/independent study coursework. As noted before, the reports required the calculation of total faculty course credits. For lectures, discussions, seminars and labs, this generally amounted to summing the credit value of each section. Assume for example that six sections of Biology 101 were taught, and that of these six sections three were lectures carrying three credit hours each and three were labs carrying one credit hour each. The faculty would have six separate teaching assignments and would generate a total faculty course credit count of 12. Where these types of straightforward courses and instructional modes are concerned, actual student headcount is not a criteria in determining "faculty course credit value".

In contrast, every student in tutorial/independent study courses is considered a separate section as faculty and student meet individually on a one-to-one basis. Each independent study student is considered somewhat of a separate teaching assignment. Unlike the credits attached to lectures, discussions, seminars and labs, the magnitude of faculty course credits accumulated for independent study courses are a function of student headcount. Their impact was disproportionate and paralleled their headcount volume. This resulted in significant shortfalls for some colleges that have large independent study offerings.

When reviewing the results of these preliminary reports, we had to keep in mind that the seven official University instruction types could be used to record data for many different types of courses. The tutorial/independent study instruction type is used for tutorials, internships, practicums, thesis, dissertation, etc. courses. Broadly speaking, this instruction type is recorded for any instructional activity where the faculty and students meet individually, on a one-to-one basis. At one institution, two social welfare courses in community service generated a shortfall of 1,500 faculty contact hours. In these courses, the students were participating in a field-based practical experience under the direction of on-site agency personnel. By and large, this type of supervision is not recorded in the University's official instructional workload file (CASA) as it is not instructional workload of SUNY faculty. In such practicums where SUNY students receive supervision from professional agency personnel, there are probably sufficient hours of supervision to fulfill faculty contact hour requirements--again assuming that the same contact hour requirements as now exist for students would be applied to faculty. These hours are not, however, contact hours of SUNY-funded instructors and are thus not recorded in CASA. Recording them in the file would significantly increase administrative workload and might distort the concept of an instructional workload file for University faculty. If the contact hour criteria must be applied to faculty, review procedures could be developed which identify and make special allowances for such courses so that their SCRH are not discounted.

As stated earlier, the cobol reports did not take section enrollment into account except for tutorial/independent study instruction types. Somehow, our project had to be restructured to properly address all components of instructional workload: lectures, discussions, seminars and labs as well as tutorials. In pursuing this, contact hours and credits must be calculated to reflect total workload and enrollments over all instruction types and sections. The Assistant Vice Chancellor for Institutional Research suggested that faculty contact hours be multiplied by student registrations and then adjusted by instruction type before being compared to total student credit hours. This approach has the advantage of using all registered students and their generated student credit hours as a criterion --one that plays a vital role in the dynamic faculty lines model which takes actual workload for a changing three-year period into account. Faculty course contact hours were thus multiplied by student registrations to maintain a consistent approach. If student credit hours are a function of course credit times registrations, then the accompanying faculty course hours may also be a function of registrations; i.e., faculty contact hours times number of students in the course.

THE ROLE OF SPSS

When the computer center was asked to implement these changes, they notified the office that it would take about a month or more. We didn't have that much time to spare, especially in light of the fact that the reports were intended as a preliminary information-gathering device. In all likelihood, they would reveal additional issues or aspects of the proposal that would require investigation and follow-up. Like many offices, our computerized information systems evolved over time. They were most often programmed in languages which were familiar to the programming staff and which facilitated rapid processing of vast quantities of data. While institutional research staff have heavily used APL (A Programming Language), their past use of other user-oriented languages through summer 1982 was not as intensive. Given the fact that the instructional workload file (CASA) had to be analyzed in a novel fashion and within a short period of time, it was decided to employ developing staff expertise and experience in SPSS.

More than 200 variables are contained in every CASA record. While this Course and Section Analysis file has existed since the early 1970's, most applications have been programmed in cobol, fortran or Mark IV. Luckily, our first task of defining an SPSS file was facilitated by the independent work of one of the staff who had completed this phase of the project in early fall 1982. In addition, various edits and statistical procedures were accomplished during that development stage and we knew that the SPSS program as well as the data base were in good condition and ready to be used.

SPSS was used as a vehicle for data capture and analysis while SPSS report writer was used to program new interim management reports. Report writer is a powerful instrument. It can easily handle thousands of variables and produce polished results. This is not to say that working with report writer is without its frustrations. While the manual may be written somewhat better than most technical documentation, the instructions are not as complete and descriptive as desired for those unfamiliar and inexperienced with this package. Report and column headings, breaks, strings, footnotes and report statistics were learned with patience and many attempts. Because the product was intended for University-wide consumption, its appearance and format along with its data had to be polished. Frequently, ad hoc internal applications need not carry the same requirements for appearance and format. Not only did we face intense pressure to produce a document containing information to assist in the initial analysis of a radical proposal, but the report had to have a quality appearance because of its distinguished and wide audience.

As institutional researchers, we turned to a user-oriented computer aid generally available to all constituencies. Through SPSS and about three weeks of pooled intensive effort, we were able to provide the SUNY community information necessary to help evaluate the impact of faculty course credit/contact hour relationships. The proposed faculty workload approach has far reaching consequences, and the colleges were anxiously awaiting whatever assistance we could provide. The SPSS reports were forwarded to the campuses on December 29, 1982 with the request to review the data and account for any substantial variations. A sample page of the preliminary, in-house document circulated to the colleges is contained in Figure 1.

A follow-up State-wide meeting was scheduled for January 12 and attendance was excellent. Of 66 SUNY colleges, 36 receive the bulk of their operating funds from the State. Twenty-nine of these 36 State-operated/funded colleges are included in the current formula approach for budgeting faculty lines. The other seven campuses consist of health-related colleges or specialized institutions for which other particular factors must be considered. Most of the 29 institutions included in the formula approach provided written comments, observations and suggestions on the new proposal. As a result of our use of SPSS as a preliminary management information tool and the subsequent analysis of an SPSS product by SUNY colleges, four important items directly related to the proposed workload approach emerged or became more pronounced. These are described in the next section.

ITEMS UNCOVERED FROM ANALYSIS OF SPSS REPORTS

While numerous items were raised by the colleges from their analyses of the SPSS reports, many were campus particular. Our review of these comments produced four consolidated items. Further investigation into these areas produced the following results:

1. POLICY ISSUES: As indicated earlier, at least one major policy issue evolved during the study. While not a result of using SPSS, this item is paramount and was included in the responses of the colleges. Specifically, should the contact hour criteria be applied to faculty? Inasmuch as the University has not yet officially responded to Budget, the only item that will now be underscored is the importance of continuing the discussions with DOB on an alternative approach to take the place of the current ES methodology. According to comments made by the Associate Vice Chancellor at a recent conference of the SUNY Association of Institutional Research and Planning Officers (AIRPO), these discussions are likely to resume in the near future. The process and pressures of finalizing a budget request for fiscal 1984-85 are winding down, and the University must once again start to

FIGURE 1

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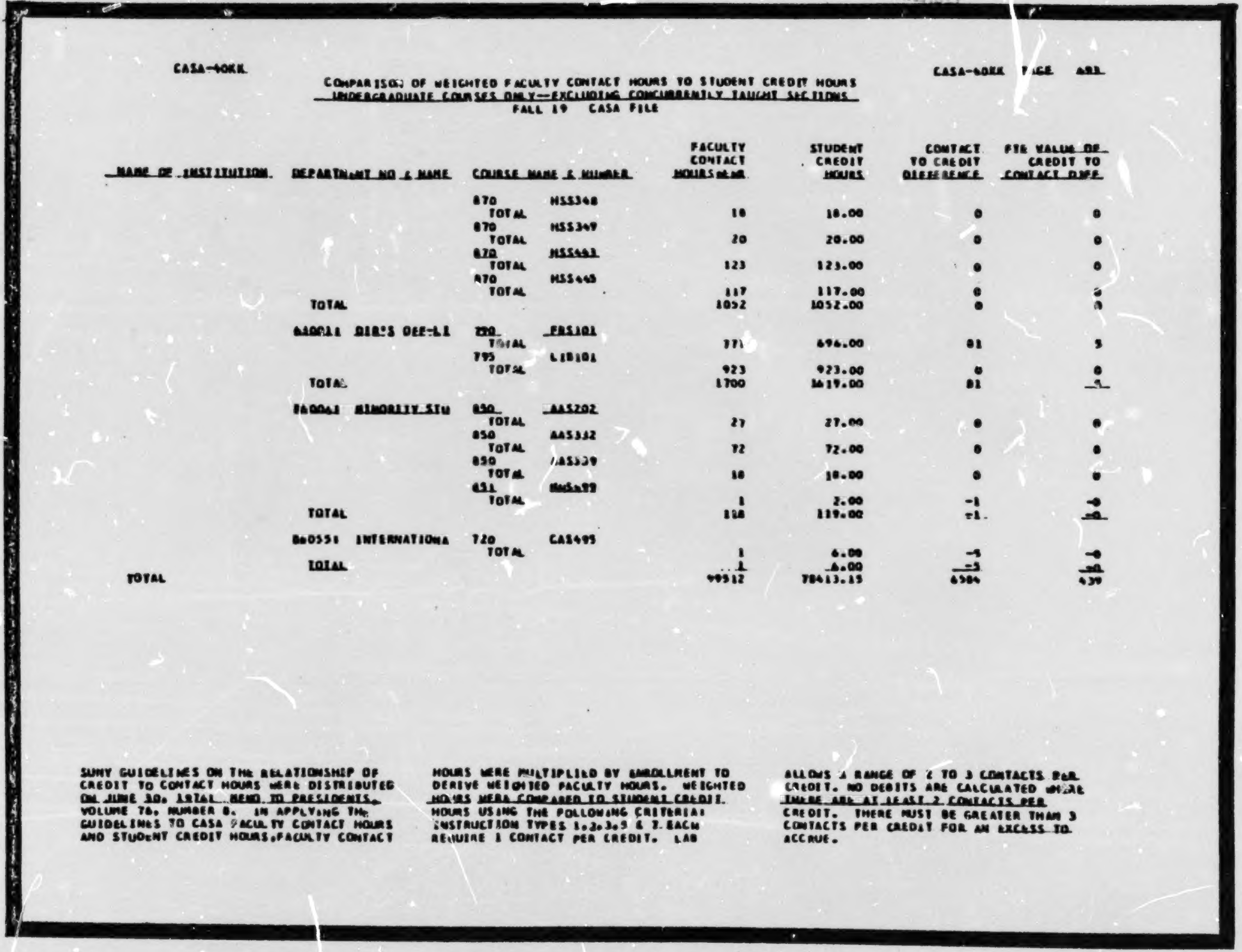

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      CASA-40KK                                                                                         CASA-40KK  PAGE   483
                         COMPARISON OF WEIGHTED FACULTY CONTACT HOURS TO STUDENT CREDIT HOURS
                         UNDERGRADUATE COURSES ONLY--EXCLUDING CONCURRENTLY TAUGHT SECTIONS
                                              FALL 19   CASA FILE

                                                                             FACULTY        STUDENT        CONTACT    FTE VALUE OF
                                                                             CONTACT         CREDIT      TO CREDIT       CREDIT TO
  NAME OF INSTITUTION   DEPARTMENT NO & NAME   COURSE NAME & NUMBER      HOURS    .          HOURS      DIFFERENCE    CONTACT DIFF

                                               870       HSS348
                                                 TOTAL                       18            18.00              0               0
                                               870       HSS349
                                                 TOTAL                       20            20.00              0               0
                                               870       HSS443
                                                 TOTAL                      123           123.00              0               0
                                               870       HSS445
                                                 TOTAL                      117           117.00              0               0
                          TOTAL                                            1052          1052.00              0               0

                        610011  DIR'S OFF-LI   790       FRS101
                                                 TOTAL                      771           696.00             81               5
                                               795       LIB101
                                                 TOTAL                      923           923.00              0               0
                          TOTAL                                            1700          1619.00             81               5

                        760041  MINORITY STU   850       AAS202
                                                 TOTAL                       27            27.00              0               0
                                               850       AAS332
                                                 TOTAL                       72            72.00              0               0
                                               850       AAS339
                                                 TOTAL                       18            18.00              0               0
                                               851       HHS499
                                                 TOTAL                        1             2.00             -1              -0
                          TOTAL                                             118           119.00             -1              -0

                        860551  INTERNATIONA   720       CAS495
                                                 TOTAL                        1             6.00             -5              -0
                          TOTAL                                             . 1             6.00             -5              -0
  TOTAL                                                                   99512         78413.15           6584             439




  SUNY GUIDELINES ON THE RELATIONSHIP OF      HOURS WERE MULTIPLIED BY ENROLLMENT TO      ALLOWS A RANGE OF 2 TO 3 CONTACTS PER
  CREDIT TO CONTACT HOURS WERE DISTRIBUTED    DERIVE WEIGHTED FACULTY HOURS.  WEIGHTED    CREDIT. NO DEBITS ARE CALCULATED WHERE
  ON JUNE 30, 1974L  MEMO TO PRESIDENTS,      HOURS WERE COMPARED TO STUDENT CREDIT       THERE ARE AT LEAST 2 CONTACTS PER
  VOLUME 76, NUMBER 8.  IN APPLYING THE       HOURS USING THE FOLLOWING CRITERIA:         CREDIT.  THERE MUST BE GREATER THAN 3
  GUIDELINES TO CASA FACULTY CONTACT HOURS    INSTRUCTION TYPES 1,2,3,5 & 7 EACH          CONTACTS PER CREDIT FOR AN EXCESS TO
  AND STUDENT CREDIT HOURS,FACULTY CONTACT    REQUIRE 1 CONTACT PER CREDIT.  LAB          ACCRUE.
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Preliminary, In-house SPSS Report
Forwarded to Colleges to Confirm Data Accuracy and Identify Areas Requiring Further Investigation

turn its attention and resources to this important issue.

Separate from the deliberations of authoritative SUNY educational bodies is the private research undertaken for this presentation. The literature reveals many instances where student credit hours or resultant FTEs are used and recommended as one important factor in budgeting funds to higher education. Thus, investigations into a SCRH approach as one measure of need appears to have merit. Along with such utilization, however, have come cautions against a rigid quantifiable approach that ignores quality issues. Casey and Harris reinforced the need to avoid insatiable demands for activity data that may divert proper attention from judgment considerations. Comments of other authorities also lead one to conclude that while SCRH may be appropriate as one element in the funding formula, examination of faculty contact hours by external agencies should be avoided. The Carnegie Council on Policy Studies in Higher Education has stated:

> States should continue to rely on private accreditation . . . (and) prepare financing formulas that will encourage diversity and new initiatives . . . (1980, p. 118-121)

One could wonder how diversity and initiative are to be encouraged if detailed formula-related faculty contact hour criteria are implemented.

A second policy issue was identified through analysis of the SPSS reports. Most institutions in our preliminary study generated faculty contact hours in excess of those that would be required under a proposed faculty contact hour policy. All colleges, however, experienced significant shortfalls for so called "required" faculty hours in the independent study/tutorial category. According to SUNY policy on student contact hours and SCRH, every credit awarded through independent study must be accompanied by one contact hour. Student effort in the field or a laboratory facility usually satisfy this criterion. When the same requirement is applied to faculty, there is a shortfall. Faculty are not in community agencies with students, nor in the laboratory the entire time students complete their independent experiments, etc. That is the nature of independent study. Given the structure of this educational experience, it appears the same criterion as exists for students cannot be applied to faculty for independent study. The campuses have written that if faculty contact hour criteria are implemented, some other policy would be needed for these instructional experiences as well as certain others that possess unique attributes.

2. COURSE TYPES: Time and again, the need for an accurate, timely, comprehensive and versatile data base has been stressed for meeting the information needs of management. In commenting upon the in-house SPSS reports, many institutions expressed a need to develop some procedure for the automatic identification of selected course types which carry unique attributes. There are now just seven instruction types available to the colleges to record the primary style of instructional delivery. As already noted, many different types of courses are taught on a one-to-one basis between faculty and student. Some help is needed to identify and isolate courses that impose significant administrative or other time requirements. Not only could this assist institutions in monitoring activity levels in courses requiring significant resources, but the process could also facilitate automatic separation of special courses from standard contact hour studies. This appears an acceptable approach for courses where special conditions/justification exist and where, if there appear to be faculty contact hour shortfalls, SCRH will not be discounted because of the other demands the courses impose.

Given the structure of the CASA file, it is not now possible to easily identify and separate special course offerings on a system-wide basis. Many things preclude this, including different course numbering/identification practices among the campuses and changes in course content and thrust from one semester to another. After discussion with every affected campus, a proposal was made to the Central Administration Institutional Research Office to implement a new use for an existing data field in CASA. The single position "sub-campus field" could constitute a mechanism whereby specific types of instructional activity could be assigned uniform identifiers on a system-wide basis. Together with the powerful SPSS "Select If" capability, this could provide State University a mechanism for differential analysis. The instructional activities and their suggested codes are as follows:

Instructional Activity	Code
Dissertation Courses	D
Master's Thesis Courses	T
Student Teaching Courses	S
Study Abroad (Overseas Study)	A
Internships/Practicums/Capstone Activities Required for Degree	C
Remedial/Developmental Courses	R
Exception Courses With Special Requirements	E

Another benefit of utilizing this approach would be the preservation of campus autonomy and individuality in course identification and numbering practices. The specifics of this proposal are now being reviewed. Campuses should receive some correspondence in the near future.

3. METHODOLOGY INCONSISTENCIES: There are numerous calculated and generated fields in CASA which contain edited or summary data. Since the course data submitted by the campuses sometimes contain inconsistencies or errors, generated CASA fields are utilized in producing the bulk of our information reports and were also accessed for the SPSS study. In comparing SCRH to faculty contact hours, contact hours by instruction type had to be adjusted in accordance with official SED and SUNY policy. These adjusted contact hours were contained at the record level only and not the section or course level. In comparing adjusted contact hours with their share of course SCRH, certain mathematical combinations produced slight overages because of the very fine level of detail with which we were working. This constituted an area demanding further investigation and work. It was determined that a new field (variable) at the higher course level of detail was needed to eliminate such mathematical overages and focus attention at a more appropriate level. The programming necessary to calculate and add this field to the file was completed last month and should contribute to the accuracy and completeness of future analyses and SPSS reports.

4. DATA PROBLEMS: The SPSS reports and subsequent analyses revealed some courses where data were not properly recorded and could adversely impact funding decisions if these data are used for that or other decision processes. Appropriate remedial steps have been put in place by the campuses which should promote more accurate and timely data.

While several policy issues remain outstanding, SPSS has contributed to the investigative process. Its use as a preliminary management tool can provide substantial assistance during the conduct of large-scale, complex studies. We recommend its consideration as an administrative as well as research tool.

BEST COPY AVAILABLE

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INSTITUTIONAL RESEARCH AND PLANNING IN THE NEXT DECADE

CHOICE AND CHANGE

Tenth Annual Conference
of the
Northeast Association
Of Institutional Research

October 16-18, 1983

NORTHEAST ASSOCIATION OF
INSTITUTIONAL RESEARCH
TENTH ANNUAL MEETING

SUNDAY, OCTOBER 16th

Preconference Brunch 11:00 am - 12:30 pm
Officers, Steering Committee and Workshop Presenters

Workshop Session: 1:00 pm- 4:30 pm

*Cocoa 2/3 - "Survey Research and Design," by Patrick Terenzini, SUNY at Albany

Cocoa 4 - "Computer Graphics," by Leah Hutten, Tufts University

Cocoa 5 - "Beginner's Guide to Using Statistical Packages," by Frank Williams, The College Board & Beverly Joyce, Suffolk College

Social Hour: 5:00 pm - 6:00 pm (Outside Aztec Room)

Session 1: 6:00 pm - 8:30 pm (Aztec Room)

Dinner & Keynote Address:
"Will Higher Education Reemerge as a High Priority?" T.E. Hollander, Chancellor, New Jersey Board of Higher Education

Social Hour: 9:00 pm - 10:00 pm (Suite G)

MONDAY, OCTOBER 17th

Session 2: 8:30 am - 10:00 am

Cocoa 2/3 Marketing

"Developing an Inquiry Tracking System for Marketing Purposes," by Gretchen Boris, Community College of Philadelphia

"A Statewide Survey of High School Guidance Counselors," by Jill Campbell & Louis Spiro, SUNY at Brockport

"Predicting the Likelihood of Matriculation for College Applicants," by Ronald Perry & David Rumpf, Northeastern University

Cocoa 4 - IR & Administration

"The Effect of Several Information Processing Approaches on the Use of IR Reports," by Jane Grosset, Community College of Philadelphia

"An Evaluation of Boundary Spanning for Examining the Role of IR Offices," by Michael Middaugh, SUNY at Utica & Gorden Purrington, SUNY at Albany

"The Impact of Leadership on the Planning Process," by Janyce Napora, University of Massachusetts System Office

Cocoa 5 - Computer Literacy

"Enabling Administrators to Use Micro-Computers," by Ernest Anderson, University of Massachusetts, Amherst

"The Changing Concept of Computer Literacy: Faculty Training Paradigms for the Future," by Leah Hutten, Tufts University

Session 3: 10:30 am - 12 Noon

Cocoa 2/3 - External Factors

"The Use of SPSS to Identify Budget Issues & Their Magnitude," by Kathleen Kopf, SUNY Central Office

MONDAY, OCTOBER 17th, Continued

"Private Fund-Raising: A Comparative Study with Larger & Smaller Institutions," by John Dunn & Leah Hutton, Tufts University

"The Impact of Market Forces on Institutional Decision-Making in a Time of Turbulence for Higher Education," Donald Hester, SUNY at Albany

Cocoa 4 - PANEL: "Institutional Analysis & Organizational Decision-Making," Richard Pattenaude, SUNY at Binghamtom, Robert Grose, Amherst College, Marvin Cook, Boston University

Cocoa 5 - Retention/Attrition

"College Student Retention: Measurement of the Relative Importance of Causal Factors," Norman Aitken, University of Massachusetts, Amherst

"Types of Data Helpful in Mounting a Campus-wide Retention Effort," by James Yess, Massasoit Community College

"A Study of Attrition in the Regents External Degree Program," by Elizabeth Taylor, New York Regents External Degree Program

Session 4: 12 Noon - 1:15 pm

Buffet Lunch (Aztec Room)

"NEAIR's First Decade," remarks by Robert Grose, Amherst College

Session 5: 1:30 pm - 3:00 pm

Cocoa 2/3 - Monitoring Students

"Student Patterns in Completing General Education Requirements," by Linda Suskie & Mark Eckstein, SUNY at Oswego

"Academic Advising and the Non-traditional Student": Collecting, Planning, Management & Marketing Information from Student Intake Forms," by Edward Roke, Marilynn Draxl, & David Karlson, University of Maryland

"Registration: A System for Monitoring Course Enrollments," by Daniel Rosenthal & Charles Tantillo, Stockton State College

Cocoa 4 - Potpourri

"Majority - Minority Differences in SAT Scores," by Julie Wakstein & Robert Lay, Boston College

"The Campus Newspaper as an IR Dissemination Mode," by Lawrence Kojaku, SUNY at Buffalo

"Determinants of Academic Promotion in Undergraduate Departments," by Gloria Dyer, Fairleigh Dickenson University

Cocoa 5 - PANEL: "2+2=4: Issues, Implications, and Analysis for Transfer Articulation" Pauline Lichtenstein, Hofstra University, Marjorie Raab, Nassau Community College, Faith Ripps, Nassau Community College, Carol Wurster, SUNY at Old Westbury

Session 6: 3:30 pm - 5:00 pm

Cocoa 2/3 - Departmental Studies

"Applying Strategic Planning in Academic Departments: Implications for IR," by Sidney Micek, Syracuse University

"Cost Benefit Analysis for Academic Programs Using a Micro-computer," by Marie Genevieve Love, Mount Saint Mary College & Colleen Fennell, SUNY at Albany

"Predictors of Departmental Viability in Periods of Decline," by Jane Robertson, Cornell University

Cocoa 4 - Market Research

"Research in Marketing," by Susan Juba, Brookdale Community College

"An Econometric Model for Packaging Financial Aid," by Robert Lay & Paul Combe, Boston College

"Characteristics of High School Seniors in New York State," by Glenwood Rowse, New York State Education Department

Business Meeting: 5:15 pm - 6:00 pm (Cocoa 2/3)

Session 7: 7:30 pm - 9:00 pm

Micro-computer Users Sharing Session (Cocoa 5)

TUESDAY, OCTOBER 18th

Breakfast Meeting: 7:15 am - 8:15 am (Hearth Restaurant) Old and new officers and steering committee members

Session 8: 8:30 am - 10:00 am

Cocoa 2/3 - PANEL: "Computer Supported Data Sharing: New Developments" John Dunn, Tufts University, Daniel Undergrove, EDUCOM, Robert Grose, Amherst College, Thomas Axtell, Wesleyan University

Cocoa 4 - Economic Impact/Outcomes
"A Study of the Economic Impact of the Community Colleges on the State of New Jersey," by Jerry Ryan, Council of County Colleges of New Jersey

"A Comprehensive Approach to Outcomes Studies," by Bayard Baylis, The Kings College

"Strategies for Assisting Academic Departments in Student Outcomes Assessment," by Sidney Micek, Syracuse University & Darryl Bullock, Mercy College

Session 9: 10:30 am - 12:00 Noon

Cocoa 2/3 - Micro-computer Applications
"A Financial Analysis Model," by Janyce Napora & Ellen O'Connor, University of Massachusetts System Office

"Statistical Analysis by Microcomputer," by Ernest Anderson, University of Massachusetts, Amherst

"Estimating 'Net Prices' for Postsecondary Students in New York State: Student Support Sources Model," by Nancy Willie, SUNY at Albany

Cocoa 4 - Potpourri
"New Jersey Cooperative Follow-up Study," by Martin Schwartz, Camden Community College, Anne Hainsworth, Gloucester Community College & Holly Staatse, Mercer Community College

TUESDAY, OCTOBER 18th, Continued

"A Study of Second Baccalaureates," by Diane Lampe, Edward Roke, & Marilynn Draxl, University of Maryland

"Institutional Accreditation as a Vehicle for Establishing a Systematic Long-Range Planning, Budgeting, and Evaluation Process: A Case Study," by Peter Cyan & Michael Middaugh, SUNY College of Technology at Utica